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SPECIAL ISSUE

Builder

hanley wood

THE MAGAZINE OF THE NATIONAL ASSOCIATION OF HOME BUILDERS

JULY 2008



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the greater the impact on our

of these homes are *made of brick.*"

— Mike Karns, *Director of Purchasing, Winchester Homes*



This Oak Hill Reserve project is a community of 83 homes. And 9 months into the last section, it's 99% sold. Good news for the bottom line. Good news for us."

Contact a brick manufacturer or local distributor to learn more about improving your bottom line by using brick. Or, see www.gobrick.com/find_brick *for a list of BIA manufacturers and distributors.*

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VOLUME 31 ISSUE 9 JULY 2008

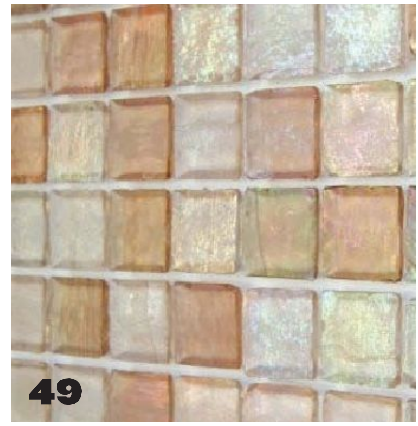


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DEPARTMENTS















ON THE FRONT COVER: WITH EARTH'S TEMPERATURE RISING AND RESOURCES DWINDLING, IT'S MORE IMPORTANT THAN EVER FOR BUILDERS TO TAKE ACTION THROUGH SUSTAINABLE PRACTICES.

ON THE BACK COVER: DEVELOPMENTS THAT DISREGARD ENVIRONMENTAL IMPACT HAVE TAKEN A HEAVY TOLL ON THE PLANET. BUILDER LOOKS AT THE PRICE WE'RE PAYING AND WHAT WILL HAPPEN IF THINGS DON'T CHANGE.

THIS MONTH'S ISSUE USES NEW PAGE ARBOR COVER STOCK, WHICH CONTAINS 30% POST-CONSUMER RECYCLED CONTENT, AND CARRIES FSC, SFI, AND PEFC CERTIFICATIONS.

COVER ILLUSTRATIONS: RANDY POLLAK

WHAT'S NEW ON: WWW.BUILDERONLINE.COM

Builder Online

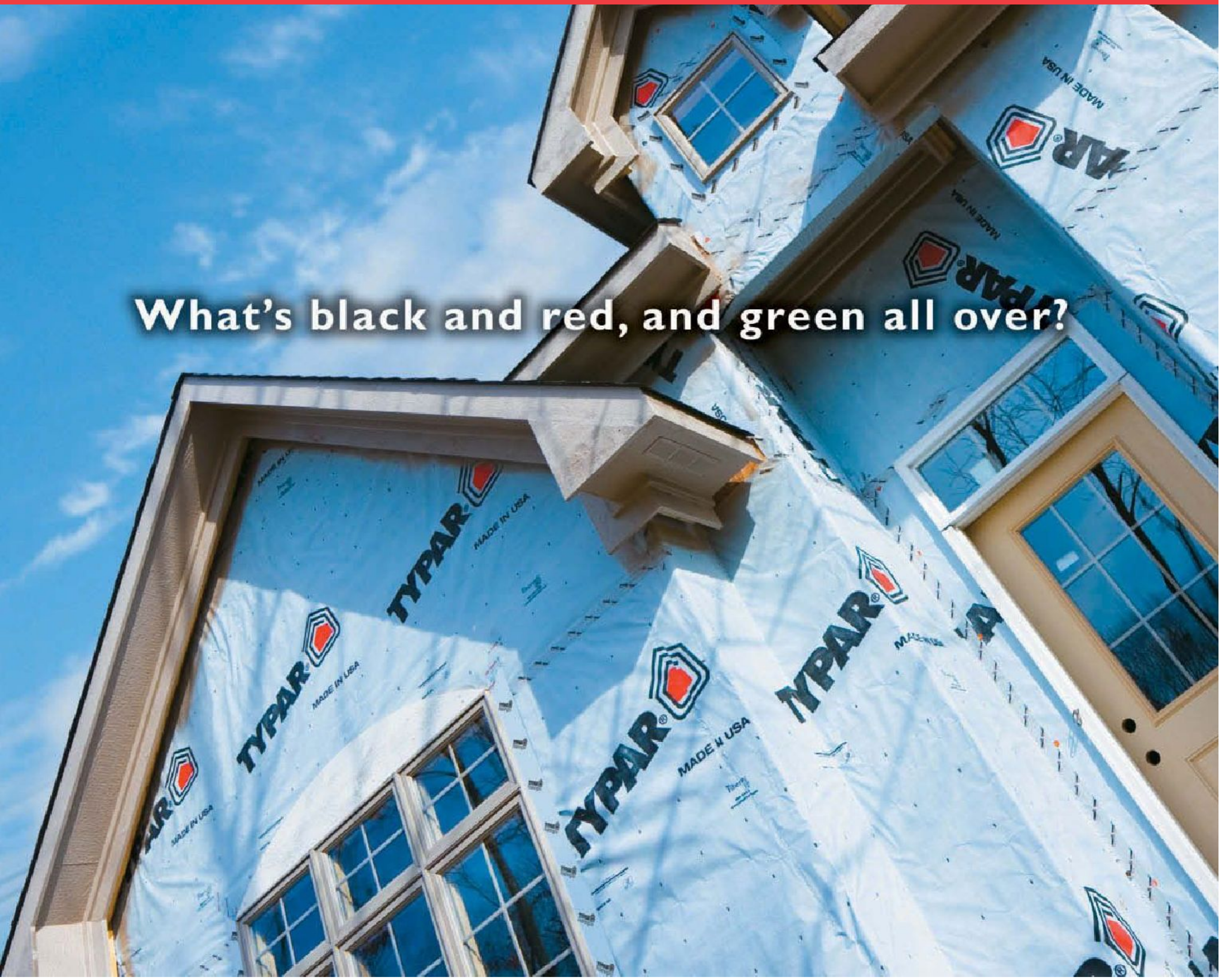
Question: What is ...

... black and white and green all over? Answer: Builder Online. Even with a double-sided issue, we still couldn't fit all of the great green-building resources into the pages of BUILDER this month. Get the full story at BUILDER Online, where you will find links connecting you to the sites of the industry experts we consulted for this month's special report. Get creative inspiration from slide shows of green projects, ranging from single homes to entire neighborhoods. Feast on facts with a chart on vehicle emissions, suggestions on how production builders can grow sustainably, and links to myriad other sources, reports, and useful information.

COMMENTS, SUGGESTIONS, AND NEWS ABOUT BUILDER ONLINE?

E-MAIL DENISE DERSIN AT: **ddersin@hanleywood.com**

UPlink // FOR MORE EXCLUSIVE ONLINE CONTENT AND ADDITIONAL STORIES RELATED TO THIS ISSUE'S ARTICLES, VISIT WWW.BUILDERONLINE.COM.



The Typar® Weather Protection System. While not visible to the naked eye, there's actually a lot of green here — as in energy efficiency and improved indoor air quality. At the heart of the system is Typar HouseWrap, which reduces the risk of air and moisture infiltration, which can waste energy and lead to mold. Typar is also environmentally sustainable with its 23% recycled content. Seeing green yet?



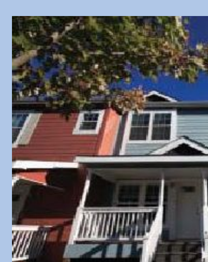
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BPA


Tired
of losing money on every payroll?
"I can't remember. How many hours did we work last Tuesday?"
EMPLOYEE TIMESHEET
NAME: Bill Kemp
DATES: 11-15
DAY START LUNCH END JOBSITE WORK DONE HOURS
MON 7:00 1/2 3:30 8
TUE 8
WED 8 1/2
THU 4:00 8 1/2
FRI 4:00 8 1/2
Reality?
Employee Signature: Bill Kemp
TOTAL HOURS: 41 1/2
Employee Time Card
Displays the total time worked by each employee
Mountain View CONSTRUCTION
Bill Kemp
Time card for: Monday, August 11, 2008 - Friday, August 15, 2008
Jobsite Name Cost Code Mon Tues Wed Thu Fri Total
Brentwood Job Framing 7:38 7:35 7:53 – – 23:06
Crestview Job Drywall – – – 7:58 7:49 15:47
7:38 7:35 7:53 7:58 7:49 38:53
Reality check
Regular Hours 38:53
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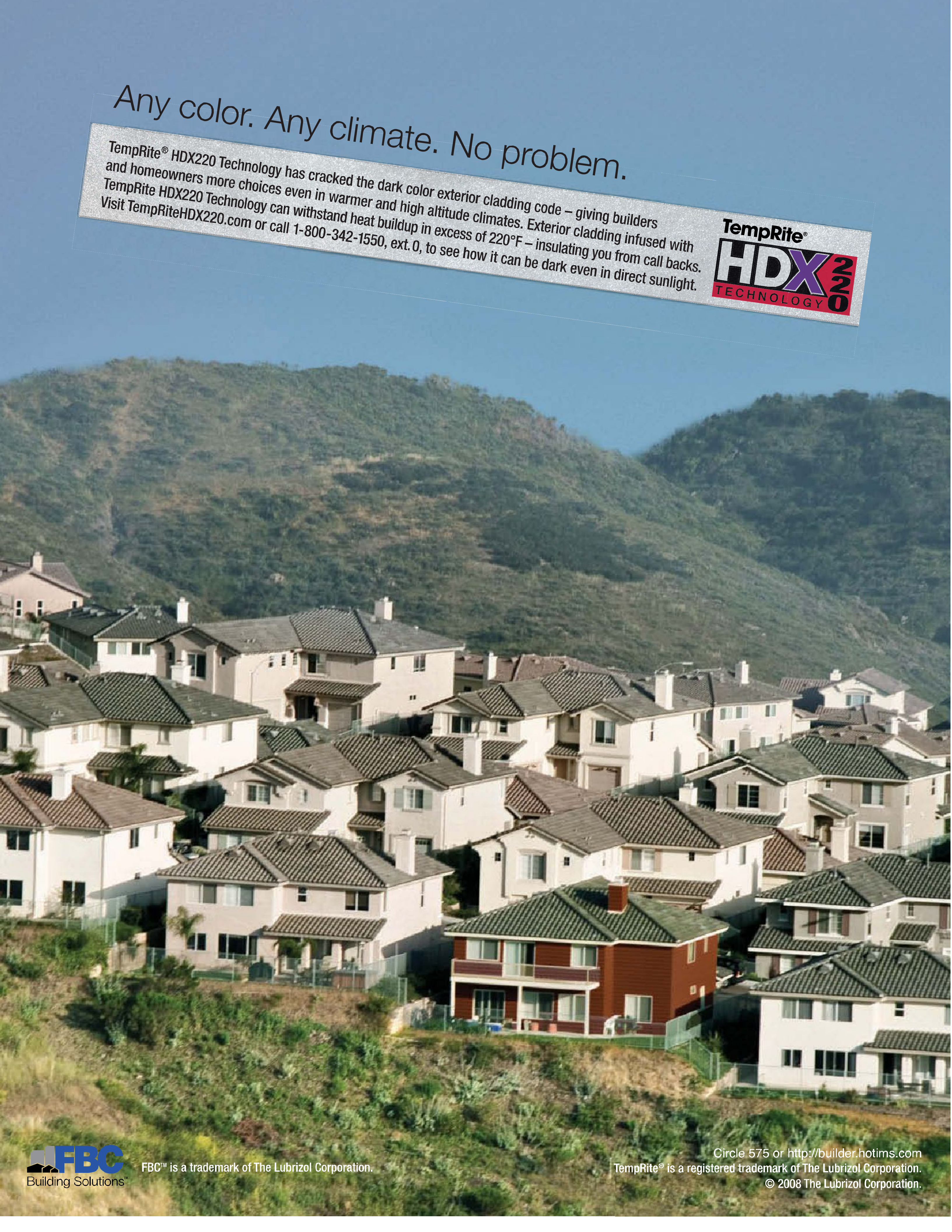
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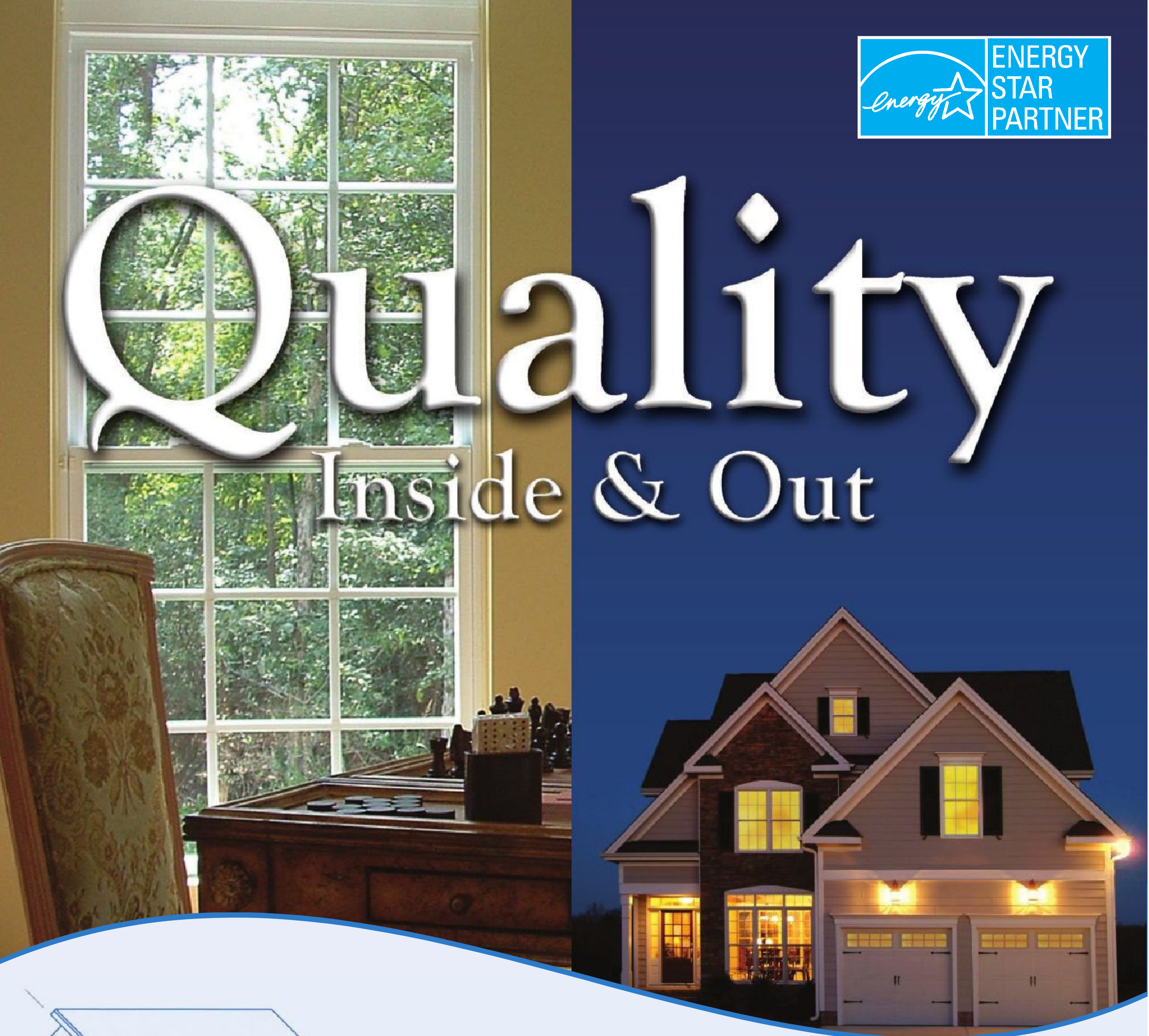
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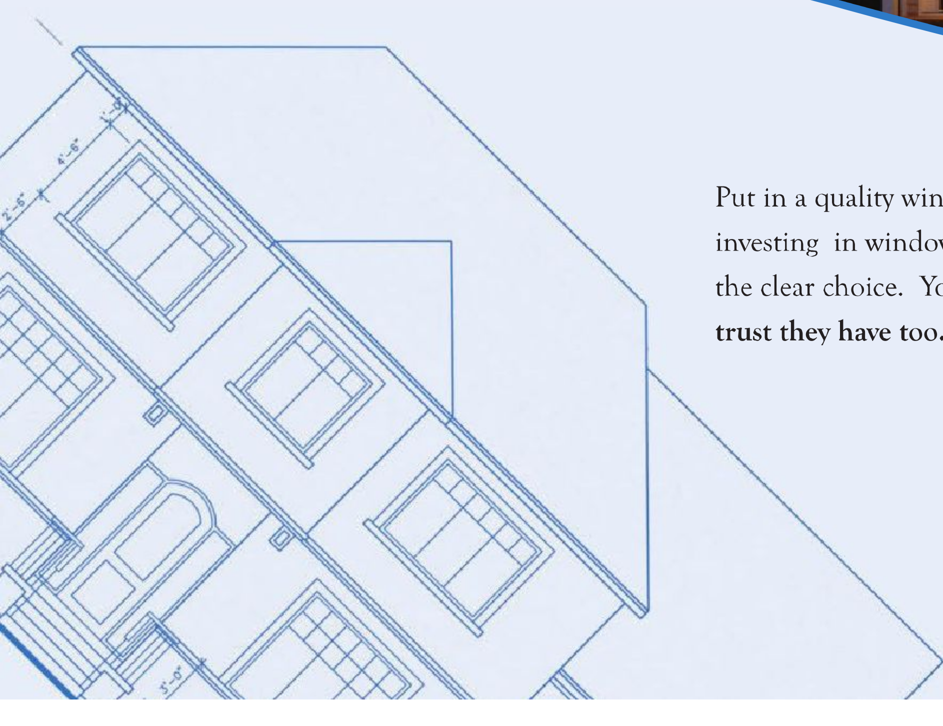
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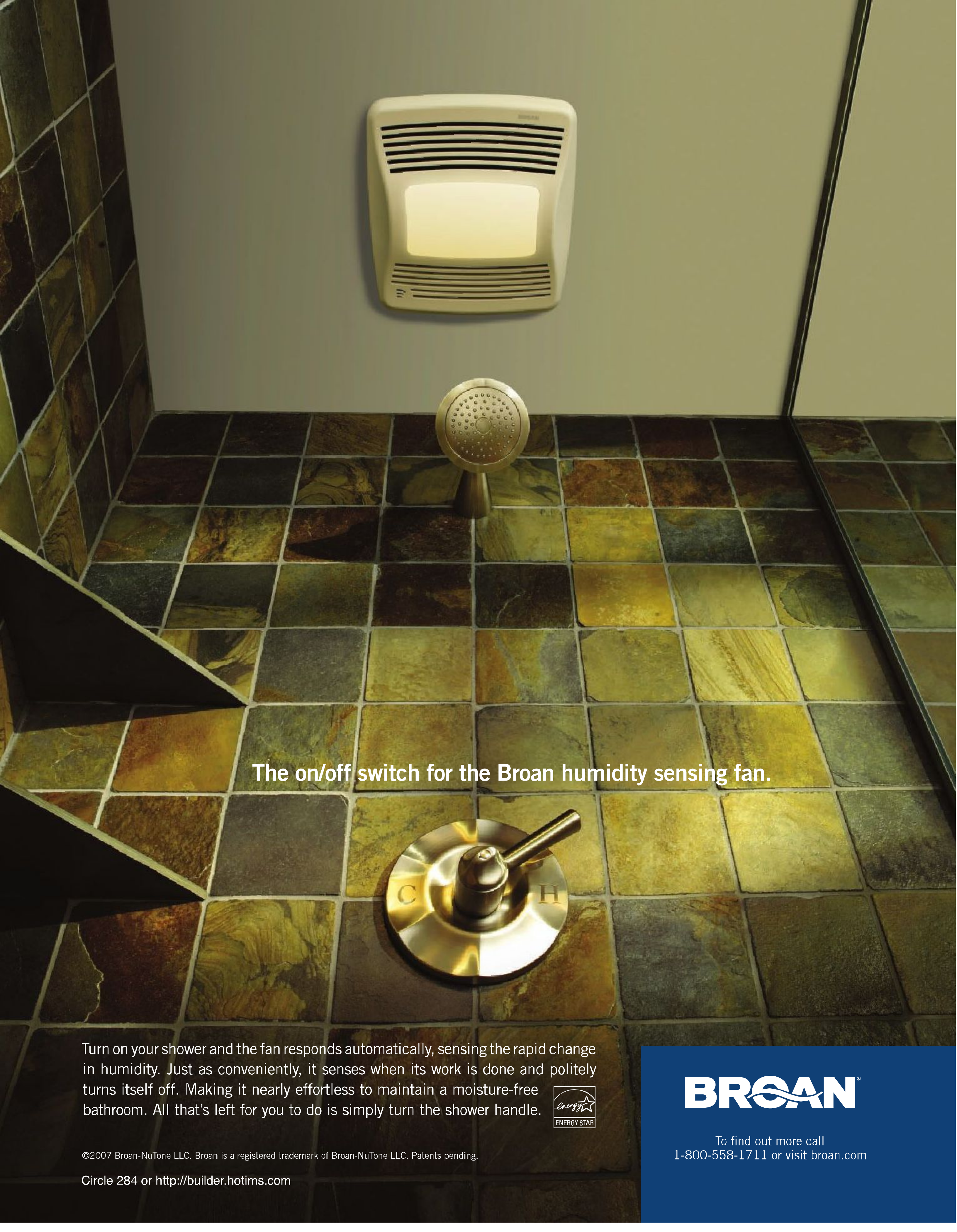
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Start Small, But Start

Building sustainable homes makes sense any way you look at it.

DON'T BELIEVE THE SCARY SCENARIOS ABOUT FUTURE CLIMATE change, habitat loss, and disappearing resources so prevalent in the media (and in the flip side of this issue) these days? Well, it's true that in averaging out the ups and downs of ice ages and tropical eras, the world has stayed pretty much the same when you crunch the numbers over the eons that it's been around.

Unfortunately, we may or may not be around for the eon when things start cooling down again.

But whether or not you're skeptical about the forecasts, the world has been changing, and I could list the changes that scientists say have already occurred—carbon dioxide levels in the atmosphere have increased by nearly 37 percent since the beginning of the industrial revolution; average global temperatures have risen by more than a degree in the last 100 years, with more than 75 percent of that increase taking place in the last 30 years; the Arctic Ocean has lost 23 percent of its permanent ice cover since 2005; polar bears are in danger of becoming extinct, to name a few.

I could also remind you of the price of oil—as if you could forget—as a reason to build homes that are more sustainable.

But I think you've heard all this already.

So if you're not yet on the sustainability bandwagon, what's it going to take?

Maybe you could be persuaded by a builder I spoke with recently who's been building green for about 10 years. He told me what a lot of other builders have said, that he didn't go into it for philosophical reasons; he wasn't a tree-hugger or afraid of global warming. He just wanted to build better houses, ones that utilized passive cooling principles, for example, instead of larger HVAC systems. He fought an uphill battle through the boom trying to sell his houses, though. Buyers were more interested in getting the most house for the money, period. But now, buyers are looking for the best deal possible, not just in the sales price, but also in what the house is going to cost them on an ongoing basis. So, just like many other "overnight sensations" who work in the trenches for years but suddenly come into sharp focus in the public eye, his company's homes now look cutting edge. His customers, and he has plenty of them, say in after-purchase surveys that they bought their homes because of the green aspects or because of their inherent energy efficiency. Not content to rest on his laurels, this builder intends to forge ahead, aiming for zero-energy homes, believing still in continuing to pursue his goal of building better houses.

But if you're just getting into this, you don't have to start with zero-energy homes.



JAMES KEGLEY

Those already building green say there can be a pretty steep learning curve at the beginning for both the builder and the subs. So start small. In fact, building smaller homes would be the perfect place to start. Plenty of boomers are looking to downsize, and young families need smaller, more affordable places to buy. If you're building closer in (an important part of sustainability and, coincidentally, where everyone wants to be right now), smaller homes make more sense. Living closer in means shorter car trips for work and errands. Lower costs for materials and less waste to haul to the dump are other benefits of building green.

Even the smallest of changes can reap big rewards. According to the EPA and the Department of Energy, "If every American home replaced just one light bulb with an Energy Star–qualified bulb, we would save enough energy to light more than 3 million homes for a year, more than $600 million in annual energy costs, and prevent greenhouse gases equivalent to the emissions of more than 800,000 cars."

That's a very big result from a very small change.

As a home builder, you are in the enviable position of being able to effect significant change on whether or not your customers will be able to afford their heating and cooling bills, on your community, and even the planet—simply by making small changes in the way you build.

If you haven't started building sustainably, it's time you did. The rewards will be enormous.

DENISE DERSIN
Editor in Chief
e-mail: ddersin@hanleywood.com

Business as Usual

I AM WRITING IN HOPES THAT YOUR PUBLICATION can help clarify some misinformation circulating in the appliance industry. GE Appliances is not going out of business. The truth is quite the opposite. We are exploring strategic options that will help grow this business—both globally and in the U.S. Here is important information your readers should know.

On Friday, May 16, General Electric announced its intent to explore strategic options for the Appliances business, which could include a strategic partnership, joint venture, spin-off, or sale of the business. The process to identify the option that makes the most sense for the future success of Appliances is being led by president and CEO Jim Campbell. The target date to complete the change in ownership is the end of the year.

Jim Campbell, I, and the rest of the management team will be going with the Appliances business. GE Appliances will stay focused on providing excellent service during this period and in the future, regardless of a new owner.

GE Appliances is a financially strong technology leader that continues to make investments and bring new products to the marketplace. We are committed to our customers, and our intent is to make this a seamless transition. The GE brand will continue to be one of our most valuable assets; we will continue to provide innovative and high-quality products; all warranty obligations and service contracts will be honored and fulfilled; all customer, supplier, and distributor agreements will remain in place; and our factory service and distribution network will continue to provide services that drive customer satisfaction.

We will strive to keep your readers updated as events unfold and as information becomes available.

DAVE BILAS
Vice President of Sales
GE Appliances
Louisville, Ky.
Via e-mail


INSIDE STORY

Inside:
30 Up To Code
PLUS MORE >>

COMMENTARY AND ANALYSIS OF CURRENT EVENTS • EDITED BY JOHN CAULFIELD

CODE CONFLICTS

Fire Drill

The debate over mandating sprinkler installation in new homes heats up.

MAY 2008 BUILDER • 29

Factors at Play

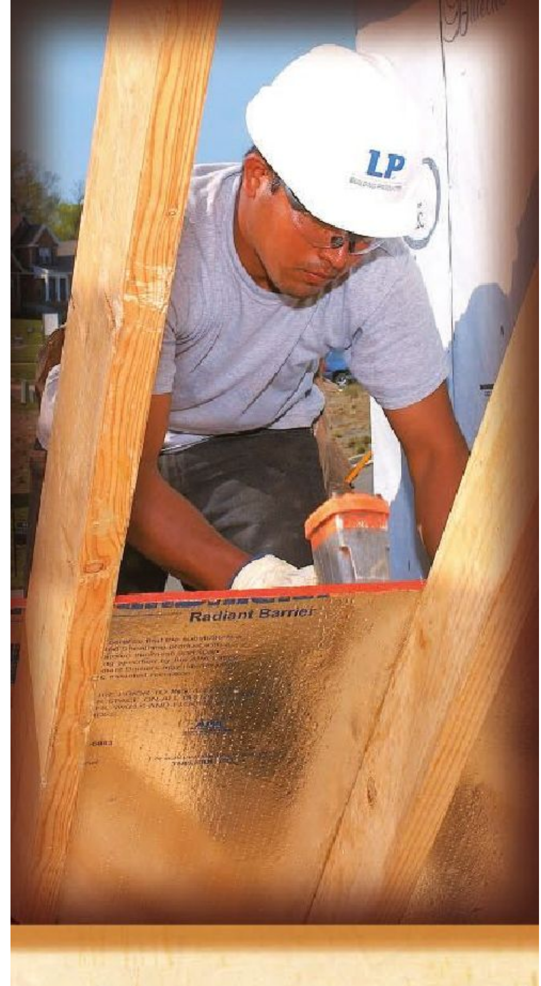
YOUR ARTICLE ON THE DEBATE OVER mandating sprinkler installation ["Fire Drill," May 2008, page 29] was well timed and, as always, informative. The issue is starting to get play here in Canada, specifically in Ontario. The reasons builders have to object to mandatory sprinklers are many. Our local associations have adopted the view that changes to the building code that mandate fire-resistant building materials as well as mandatory smoke alarms do not seem to have resonated with local politicians trying to score cheap political points with the assistance of a well-financed sprinkler association.

What was particularly interesting is the use of "evidence" that Vancouver, British Columbia has not had a home fire death (presumably in new homes) since it passed its sprinkler ordinance in 1990. Here in Ontario, a far more populous area, we have yet to uncover a new-home fire death in the same time span without mandated sprinklers. So I am not sure that fact is pertinent to the argument and perhaps there are the factors mentioned above, instead, at play.

BRIAN JOHNSTON
President
Monarch Corp.
Toronto, Ontario, Canada
Via e-mail

DO YOU HAVE A COMMENT OR QUESTION?

E-MAIL DENISE DERSIN AT:
ddersin@hanleywood.com



Calendar

JULY
30–AUGUST 2

SEBC/GreenTrends, Orlando, Fla.
The Southeast Building Conference has teamed with GreenTrends, the annual trade show and conference of the Florida Green Building Coalition, to offer 17 intensive courses leading to valuable professional designations and 48 seminars that cover the gamut of construction, green building, remodeling, design, and merchandising, as well as specialized training. Contact: www.SEBCShow.com.

SEPTEMBER
22–24

Managing for Profit, Chicago
Don't miss this seminar covering topics such as how to set profit goals, determine what profit is reasonable, calculate and interpret pricing formulas, explore ways to increase gross margin, cut construction costs, and control operating expenses. Contact: www.LeeEvansGroup.com.

OCTOBER
6–7

Wood-Plastic and Natural Fiber Composites 2008, Baltimore
This conference is a unique forum to learn and to network with executives and other key people from around the globe in the wood-plastic and natural-fiber composites and vinyl industry, and to discover your company's most promising commercial and technical opportunities. Contact: www.PrincipiaConferences.com.

9–10

JLC LIVE Midwest, Minneapolis
The leader in hands-on construction education, JLC LIVE provides the perfect showcase for the residential construction market. Delivering the most relevant information, education, and training in the industry, JLC LIVE features many new topics, speakers, and demonstrations—all designed to provide owners, managers, and key personnel with vital information to increase productivity and profitability. Contact: www.JLCLIVE.com.

13–15

Multifamily Executive Conference, Las Vegas
This event is the only conference dedicated exclusively to senior-level executives, who make it a point to return year after year. The three-day conference draws hundreds of top-level executives who attend for the strong blend of seminars, networking opportunities, award programs, and exhibitions. Contact: www.MFEConference.com.



15–16

National Green Builders Products Expo, Las Vegas

This event brings you the manufacturers and providers of goods and services related to the building, remodeling, rehabilitation, or renovation of green commercial and industrial structures, as well as single- and multifamily housing. This is a focused two-day event bringing you face to face with all the green building products you want and need. Contact: www.ngbpe.com.

16–18

StonExpo, Las Vegas

This event is the best place to see and compare the largest selection of stone and stone products from around the world. Consistently delivering the entire stone industry with an expanded range of products for every stone professional, it will be an event you won't want to miss. Come see the 7,500-plus fabricators, installers, architects, builders, general contractors, and more. Contact: www.StonExpo.com.

22–24

EcoHome Expo & Conference, Austin, Texas

Created for the green residential construction industry, this event will debut in one of the greenest cities in the country. EcoHome Expo's comprehensive educational program will include 40 seminars and workshops as well as 35,000 net square feet of the latest green building products, services, and technology. Contact: www.EcoHomeExpo.com.

NOVEMBER

3–5

Big Builder '08 Conference, National Harbor, Md.

Join us for a special election-night Big Builder '08 Conference designed to help you learn from the market and move toward a new era of growth. This year, the emphasis is on pragmatic problem solving based on solid industry intelligence. Learn from expert speakers about economic forecasts and the key drivers of success in the new political landscape. Contact: www.BigBuilder.com.

6–8

2008 Sunbelt Builders Show, Grapevine, Texas

In Texas and the Southwest, local economies are strong and housing prices are among the most affordable in the U.S. Celebrate this good news at the 2008 Sunbelt Builders Show. Nearly 20 percent of all Americans who moved in the last few years have relocated to Texas, most of them in the Dallas/Fort Worth area. Whether you're marketing products or building *(see page 30)*

and remodeling, Sunbelt offers you a positive business climate in which to learn, network, and have fun. Contact: www.SunbeltBuildersShow.com.

15–20

International Pool/Spa/Patio Expo, Las Vegas
The International Pool and Spa Expo, Backyard Living Expo, and AQUA Show have been combined into one mega show. This show leverages the strengths of all three shows, creating unique opportunities for networking and interaction with 1,000 companies filling 3,000 booths. Attendees include pool and spa builders and installers, custom home builders, and design center professionals. The accredited conference program features 75 seminars. Contact: www.PoolSpaPatio.com.

DECEMBER

8–10

Reinvention Conference, Austin, Texas
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3–5

International Roofing Expo, Las Vegas
The International Roofing Expo is the must-attend event for commercial and residential roofing professionals to stay abreast of market directions, trends, and cutting-edge technology, as well as participate in educational events focusing on the latest issues. Attendees include 9,000 roofing contractors, builders, remodelers, consultants, architects, and other industry professionals. The comprehensive educational program features 45 sessions addressing a multitude of roofing industry issues. Contact: www.TheRoofingExpo.com.

20–23

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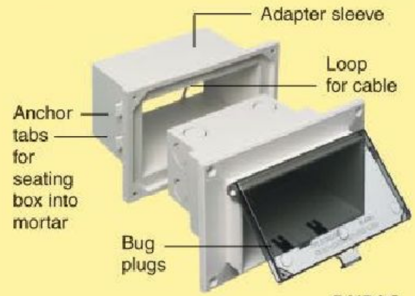
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GREEN HOUSE

SUSTAINABLE DESIGN, CONSTRUCTION, PRODUCTS & SALES ■ EDITED BY RICH BINSACCA



S U S T A I N A B L E   L I V I N G

Green and Affordable

Seattle's Croft Place Townhomes effectively incorporate a high green standard into low-income rental housing.

Croft Place Townhomes in Seattle's Delridge neighborhood debunks the myth that green is only for high-end housing or has to bust the budget to be effective. In fact, it makes a case that green is tailor-made for affordable housing.

The 21-unit, low-rise rental apartment project not only boasts a laundry list of resource- and energy-saving features, but also serves low-income families with a high-quality, durable, and attractive product. "Sustainability is a primary principal of our organization," says Parie Hines, project manager for the Delridge Neighborhood Development Association (DNDA), the project's developer. "Green building makes sense for low-income families."

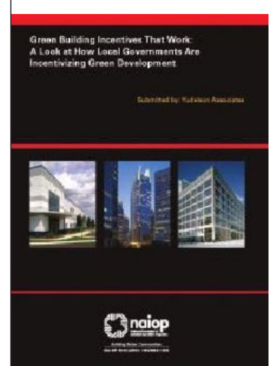
Here's why: Following Seattle's Built Green program checklist, the units were designed and built to reduce monthly utility expenses, keep ongoing maintenance costs in check, and provide a healthier indoor environment. "Affordable housing is in such a crisis," she says, "we need to consider the best solutions."

Croft Place Townhomes earned a 3-star rating (out of 5) from Built Green with features including native and drought-tolerant landscaping replacing turf grass in properly prepared and amended soil, which eliminated the need for mechanical *(see page 36)*

PHOTOS: LEFT: COURTESY DELRIDGE NEIGHBORHOOD DEVELOPMENT ASSOCIATION; RIGHT: COURTESY NAIOP

Green Incentives

Builders and developers weaving their way through local red tape to get a little something back for building green might want to check out "Green Building Incentives That Work," a 40-page report written by Yudelson Associates and prepared for and funded by the National Association of Industrial & Office Properties Research Foundation. Free online at www.naiop.org/foundation/green



incentives.pdf, the report features case studies and a list of local government programs by state, among other lobbying tools for builders. The leading public incentives for green building include local utility program rebates, government grants, faster approvals, and publicity opportunities. ▸

landscape irrigation. DNDA also specified Energy Star–qualified appliances and lighting which, when combined with construction practices, resulted in a 10 percent energy savings compared to code.

In addition, water heaters are located closest to the highest water-use appliance in each unit, and roof-mounted photovoltaic (PV) arrays that offset the power grid by 2 percent accompany the units.

The project also employed a construction waste recycling program during production, used several materials with recycled content (including siding, roofing, and insulation), and created a built-in recycling center for residents, equipping them with in-unit receptacles. It also gained green points for using one-third of a 3.1-acre infill parcel within a quarter-mile of public transportation, thus reducing vehicle emissions produced by commuting residents.

With Croft Place Apartments, DNDA gained a greater perspective about its sustainability mission. "Following Built Green allowed us to track [progress] and work with designers and contractors to establish benchmarks," says Hines. Going green also helped secure public financing, financial incentives from the local utility (which purchased and is monitoring the PV system), and a grant used by residents to design a school bus shelter and gateways *(see page 38)*

THE SCIENCE OF GREENWASHING

Shades of Green

As consumers tire of greenwashing practices, both products and homes are being required to substantiate the green claims they make.

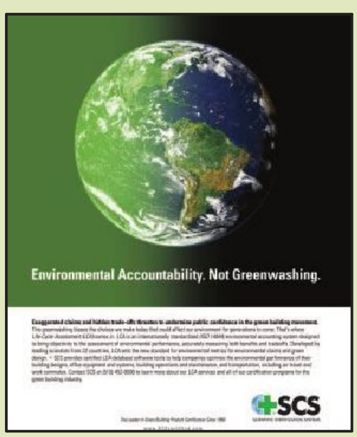
The term "greenwashing" has been around about as long as its root word, relied upon to unearth exaggerated or untrue claims (made on purpose or unwittingly) about the environmental impact or value of a given product, including homes.

But given the rapid proliferation of both green products and buildings across the country, efforts to better define the term—and ferret out offenders—are relying more on science than trial-and-error or taking a label of ingredients at face value. "The trend now is to scientifically certify green claims against a battery of standards and test methods," says Ed Wyatt, program manager for material content certification at Scientific Certification Systems in Emeryville, Calif., one of an increasing number of independent entities and public agencies providing that service.

Even then, however, Wyatt and others see manufacturers and builders misusing the certifications they earn once the marketing staff takes over. "There's no such thing as an 'eco-friendly' certification," he says, recalling a recent manufacturer's packaging claim. Far more prevalent than misleading PR, he says, are truly unsubstantiated claims for which no scientific basis exists.

To combat greenwashing, builders and specifiers are asking for more information and third-party verifications, and applying comprehensive, software-enabled life-cycle analysis metrics to gain a more solid footing for their projects.

They also are relying on green building program standards to guide them to the greenest products and building practices.



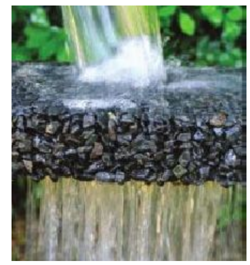
"They give you a framework with which to judge if something meets the qualifications of a truly green product," says Fort Worth, Texas–based builder Don Ferrier, such as specific water flow rates for plumbing fixtures, as verified by a third party, as opposed to something simply marketed as a low-flow faucet.

Failing to go the extra mile can put builders at risk of becoming greenwashers themselves. "Currently, it's easier to greenwash a building than a product or material," says Carl Seville, owner of Seville Consulting in Decatur, Ga. Even if a builder is diligent in his specifications, he says, the value of the greenest materials can be wasted on a poorly built and ill-performing house. "You can't put lipstick on a pig."

Just as builders, architects, and specifiers are starting to hold manufacturers accountable for their environmental impact claims, home buyers are becoming more eco-savvy, says Wyatt, perhaps to the point of questioning the value of using environmentally sustainable products and materials on a 4,000-square-foot house that required more material to build and uses more energy—even if efficiently so—than a smaller home. "It's a slow process, but eventually they'll put the products in a larger context."—*R.B.*

Pave the Way

An increasing variety of permeable surfaces allow builders and developers to offer driveways and other monolithic hardscaping with positive environmental qualities.



The Permapave rainwater system, for instance, helps mitigate stormwater runoff pollution. The natural stone pavers (available in seven colors) filter 100 percent of gross pollutants as stormwater passes through the substrate at a flow through rate of up to 7.5 gallons per second per square meter, returning it clean to the underground aquifer. The pavers are compatible with standard masonry units and pavers for a seamless look, hold up under light traffic conditions, and are non-slip.

Net Zero

The city of Issaquah, Wash., near Seattle, is in the planning stages of a 10-unit townhouse project in which the 500- to 1,700-square-foot units will adhere to a net-zero energy use and carbon emissions standard. Slated for completion in late '09, the demonstration project will be promoted live and on the Web, including a blog tracking its progress. ▸

PHOTOS: LEFT: COURTESY SCIENTIFIC CERTIFICATION SYSTEMS; RIGHT: COURTESY PERMAPAVE INDUSTRIES



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into the community, among other artistic elements.

All of the 21 apartments, ranging from 650-square-foot, one-bedroom units to 1,580-square-foot, four-bedroom dwellings, exclusively serve residents earning 50 percent or below Seattle's median income. A third of the apartments are reserved for families transitioning out of homelessness, for which the rent is no more than 30 percent of their income.

While Hines admits that Croft Place Apartments could have been built for less, the final cost was comparable to medium- or high-end housing elsewhere in the city. Because of their use of city funds, DNDA was required to pay prevailing wage rates for workers, something private developers don't typically do, thus boosting the budget further.

But the payoff, if not immediate return in investment, has long since been satisfied. Hines reports that residents take pride in their little community, a feeling nurtured by the artistic elements they created and personalized and by the pedestrian and neighbor-friendly atmosphere enabled by the master plan. Sustainable indeed.—*R.B.*



GREEN BUILDING MANDATES

Upping the Ante

Three green-minded communities raise the bar for energy use and resource efficiency.

When you think of municipalities that have led the charge to implement green building standards for new homes and other buildings, Boulder, Colo.; Austin, Texas; and San Jose, Calif., are among those at the top of the list. But despite legacies of green building programs dating back a decade or more and mature markets of like-minded (and skilled) builders, these three communities still aren't satisfied.

In March (and effective in May), the commissioners of Boulder County enacted the first green building mandate for all new homes built in the unincorporated areas of the county's borders. Called BuildSmart, the ordinance comes on the heels of last year's upgrade to Boulder city's longstanding Green Points program. In addition to deconstruction and waste management standards for new and remodeling projects, the main focus is on energy efficiency. Depending on square footage, builders will be required to meet a minimum HERS (home energy rating system) total and prove energy performance of at least 15 percent better than current code minimum. "Because we'll serve larger parcels and lower-density projects, we'll also be able to address issues of orientation," which the city's standards practically cannot, says Michelle Krezek, a county staff planner.

In Austin, the unofficial birthplace of green building programs, city leaders are expected to enact a more robust minimum standard for new homes built in the downtown and an adjacent area. To gain a permit, homes and buildings must achieve a 2-star status (out of 5) from the Austin Energy Green Building program, up from a previous lone star–rating requirement. City officials and green building consultants say there should be no extra cost to gain the additional star, citing design solutions as opposed to mechanical or device-driven systems. Eventually, the new minimum standard will likely apply citywide.

City leaders in San Jose, meanwhile, are considering whether to extend a minimum LEED-Silver rating mandated in 2001 for most new public buildings to private projects, including housing. The local HBA is lobbying for a voluntary standard to maintain competition and business investment, but Mayor Chuck Reed and other leaders appear adamant that some minimum requirements are unavoidable. "Mandates are coming," said Reed in a *San Jose Mercury News* report last fall. "We may be ahead of the curve in how we implement them." Some city policymakers are wary of incentive-based plans, saying those in place have largely been ignored. A mandate on private projects, they say, would take the city's greening policies a step further.—*R.B.*

GOT GREEN PROJECTS, PRODUCTS, OR DESIGNS?

E-MAIL DENISE DERSIN AT: **ddersin@hanleywood.com**

"We expect it to be cutting edge on a national level," says city project manager Brad Liljequist. "But we're already finding that getting to a net-zero standard is more about piecing together parts that are already available." The project team, including local builder Noland Homes, is hoping the project will proliferate. "If it's not replicated in the general marketplace, then we have not met our mission of changing the market to aggressively green housing," says Liljequist.

Future Green

Environmental science is an established major at colleges and universities across the country, but the program at Ferrum College, a four-year institution in Ferrum, Virginia, just got a boost from West Development Group (www.wdgsilicones.com), a supplier to the commercial roofing industry. WDG helped establish a scholarship fund at Ferrum for students pursuing the degree, donating a percentage of all future sales of its environmental products (including solvent-free silicone roof coating) to the fund and encouraging its business and research partners to donate as well.

UP link

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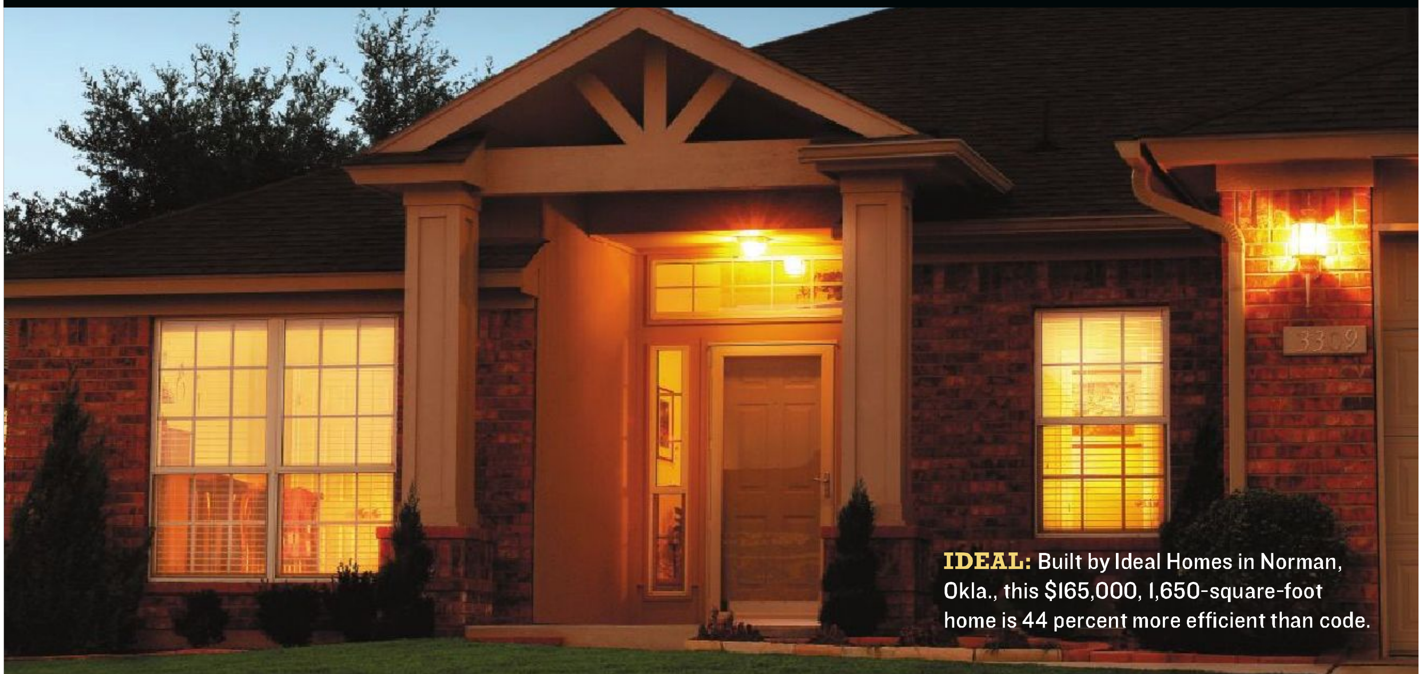
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IDEAL: Built by Ideal Homes in Norman, Okla., this $165,000, 1,650-square-foot home is 44 percent more efficient than code.

COURTESY IDEAL HOMES

THE BUSINESS CASE FOR BUILDING GREEN

To Go Green, or Not To Go Green

Home builders will be building green, ready or not.

Builders in Colorado have seen and felt the excitement of green building before, back in the late 1970s and early 1980s when incorporating passive solar into homes was spurred by federal tax credits.

Though that wave of home building environmentalism petered out as the tax rebates dried up in 1985, another and more nationally vibrant green movement is alive and kicking today. Even builders not based in California, Colorado, Austin, Texas, and other green building hot spots are finding their customers asking about energy efficiency or homes that are built more sustainably.

But something is different this time around, says Tom Sattler, owner and president of Sattler Homes, based in Greenwood Village, Colo. Sattler is a custom builder who has designed a line of energy-efficient production homes. He soon will be building all his homes to at least that standard, if not to Colorado's Built Green standard, which requires that homes be at least 50 percent more efficient than code.

The difference in the environmental movements then versus now, Sattler thinks, is momentum.

"It is getting very, very strong," Sattler says. Green building is projected to grow as a share of the overall residential construction market from just 2 percent in 2005 to between 12 percent and 20 percent in 2012, according to research presented at the National Green Building Conference in New Orleans by Harvey Bernstein, vice president of Industry Analytics, Alliances and Strategic Initiatives for McGraw Hill. In dollar terms, that's an increase in business from $7 billion in 2005 to between $40 billion and $70 billion in 2012.

But the surge in interest is coming not only from environmentalists, but also from regular families trying to save money on their energy bills. *(see page 44)*

"With our buyers, it all boils down to dollars and cents," says Vernon McKown, president of sales for Ideal Homes, a Norman, Okla.–based builder of energy-efficient entry-level homes, and one of Builder's America's Best Builders in 2007. "It's got to save them money."

A GREEN PERCEPTION

That's because Ideal, which faces price cutting in its market from competitors such as D.R. Horton, passes all of the costs—roughly $3,000 more than it would cost to build conventionally—on to the consumer with a promise of low monthly energy bills.

And while there is no hard statistical proof yet that consumers will pay more for green, Ideal ranks as the No. 2 builder in Oklahoma City with a 5.5 percent market share, outselling its competitors using energy efficiency as a key differentiator.

"That's a significant amount of money, $3,000," says McKown, for homes that range from $109,000 to the low $300,000s. "But $24 a month, in our typical house, is the guaranteed utility cost. Our buyers' homes are running cheaper than our competitors by $60 to $100 per month."

Green Items	Additional Cost
Inspections/Modeling	$3,000–$5,000
2x6 exterior walls	$4,000–$6,000
Housewrap	$2,000–$4,000
Asphalt paper over housewrap	$1,000–$2,000
High-quality windows	$8,000–$10,000
Blown insulation	$3,000–$40,000
Tight duct systems	$1,000–$2,000
Upgrade furnace or boilers	$2,000–$5,000
Upgrade a/c units	$2,000–$5,000

PRICING GREEN: Sattler Homes incurs additional costs when building green versus building traditionally. The company uses some of the building practices, such as 2x6 exterior walls, on both its green and non-green homes.

SOURCE: SATTLER HOMES

Every year, Ideal examines how much extra it spends building homes to be energy efficient and determines if that cost to compete is still worth it, McKown says. It is as long as consumers are willing to pay. That's the bottom line; currently, consumers are driving green building, and with energy prices the way they are, it's a push that is unlikely to lose momentum.

"Builders will change based on what homeowners say," says Carlos Martin, the NAHB's assistant staff vice president for construction codes and standards. "Right now, the business case is, there's potential. The studies aren't there yet to know if they are selling more because they are green builders. But there is a perception, and a lot of our builders see that perception."

Sattler finds most of his customers ask whether his homes are green or energy efficient, they listen to the sales pitch, then mentally check a box in their head, and that's as much as they think about it, he says. But Sattler's customers are different from McKown's; they are people who are far more likely to care that radiant heat is more comfortable than whether it is more efficient.

WHAT CONSUMERS WANT

Some builders, Sattler included, are frustrated by green standards that confuse the idea of what green is, as well as by builders who do a few things, but then market their companies as green.

Other builders are frustrated by logistics; land they bought may not offer the best sites for building green houses, says the NAHB's Martin.

And builders in general do not like being dictated to, which Sattler feels is happening in the case of green building.

Where is the pressure coming from? "The movement, first and foremost, possibly followed by energy costs. When I say the movement, I mean the 'Save the Polar Bears' people, all of that," says Sattler of those who are pushing green building, adding that pressure from environmentalists eventually leads to government mandates.

"If we do take the responsibility [and build green], maybe we can fend some of that off. You've got to look at the science and study it," says Sattler. "You've got to figure out what the consumer wants, and you've got to be willing to change and react."

The mandates are coming, some argue, because, according to the U.S. Energy Information Administration, residential and commercial buildings account for 48 percent of all energy consumption in the U.S., and green home building has the potential to lower energy expenditures by 50 percent, according to Bernstein.

Not all mandates are necessarily bad, say some builders. One that would be easy to accommodate, says McKown, would be on a window standard.

"If we know that high-performance windows can reduce the cooling load on a house by 50 percent, and if we can reduce the cooling load by 50 percent and your air conditioner is 25 percent of the total electric consumption of the house, then why wouldn't we do that? That ought to be required. And that's just the windows," McKown says.

But whether builders want to go green or not, it seems they will have to in order to remain competitive. Even Sattler, who still argues that most consumers are not willing to pay for green features, thinks home building is on the cusp of major advances.

"In 25 years, we're going to look back at this period much like we looked back at the race to the moon, at the technology that was created because of that effort, and we'll say, 'Look at what we did to create more fuel-efficient cars. Look at what we did to create zero-energy homes,'" Sattler says. "There will be positives that come out of it. But sometimes it's frustrating to those of us who don't want to see it mandated or shoved down our throats when the consumer doesn't want it. But at the end of the day, there will be clear benefits and advantages."—*E.B.*

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Green Pieces

A sustainable house is the sum of its many, many parts.

As interest in the environment grows, it's hard to turn on the television without seeing a story that offers advice on how consumers can go green. But while it's true that every little bit helps, there are no quick fixes on the road to sustainability. This is especially true in home building.

Loading up your houses with green building products won't mean much if other (more important) elements of sustainability are ignored. So, if your homes are not thoughtfully designed or do not follow building science principles, no amount of green products will help you or your buyers.

But the right products *can* help you follow through once you've started building green. Assuming you adhere to the important elements of sustainable building, you will want to specify the right items, such as fixtures that save water, materials made with recycled content, and appliances that sip, rather than gulp, energy.

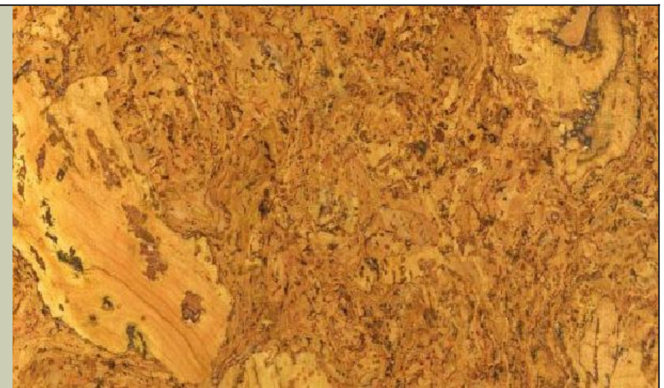
On the following pages are 13 products (with seven more online) that will make a difference. Check out items such as soybean-based foam insulation, tankless water heaters that save energy and help provide better indoor air quality, and tiles made from reconstituted leather scraps. The products you choose can make a big difference between seriously green and so-so green. **B**

(see page 50)

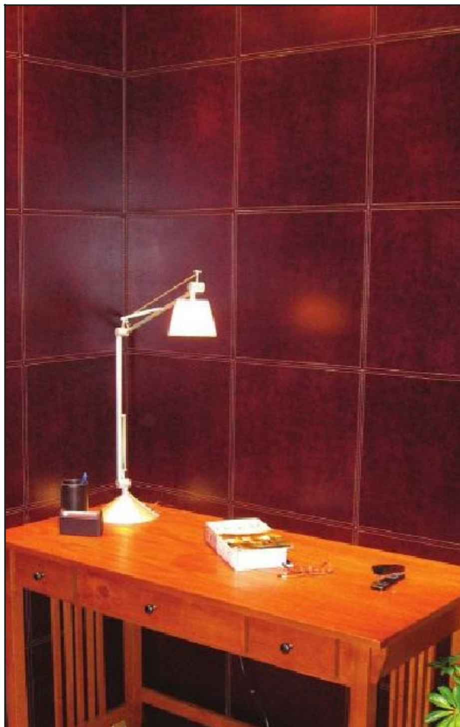
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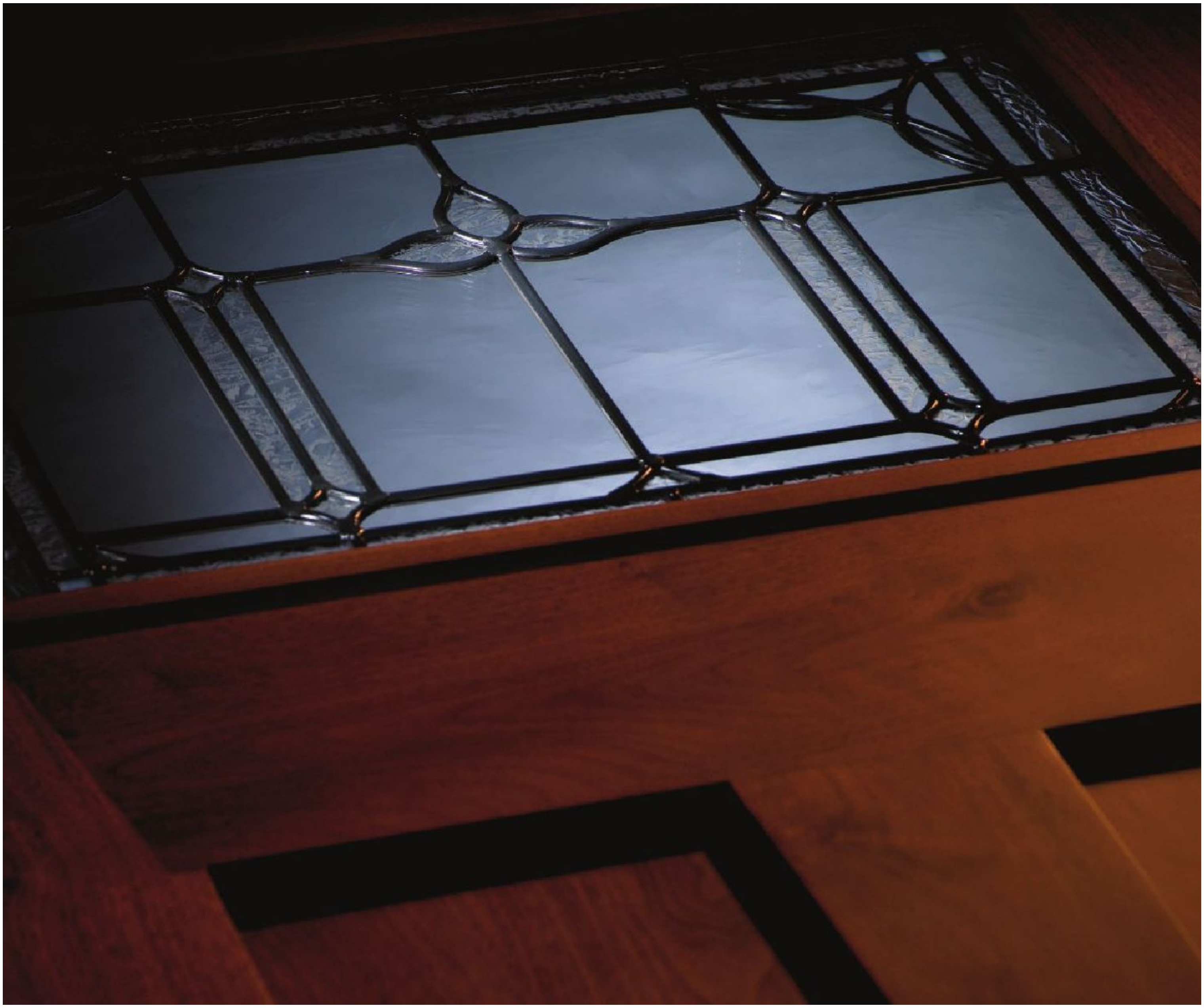


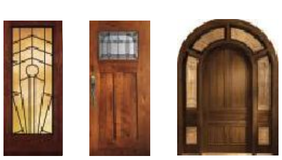
GREEN BEANS: The maker uses rapidly renewable soy beans to produce a line of spray foam insulation products that can help reduce utility bills by up to 50 percent. Available in closed-cell and open-cell formulations, BioBased products contain no chloroflourocarbons or hydrochloroflourocarbons so they are better for the environment than petroleum-based products. ■ **BioBased Insulation. 800-803-5189. www.biobased.net. Circle no. 106.**

GREEN TEAM: Cabinets don't have to be made from wood. This manufacturer offers Simply Green kitchen cabinets and bathroom vanities in bamboo. Standard features include smooth doors and end panels, $^{3}/_{4}$-inch-thick shelves, soft-close drawers, and concealed European hinges. Cabinets come in standard sizes in two finishes. ■ **Mr. Bamboo. 888-672-2628. www.mrbamboocabinets.com. Circle no. 107.**

(see page 52)

UPlink FOR MORE PRODUCT INFORMATION, VISIT EBUILD, HANLEY WOOD'S INTERACTIVE PRODUCT CATALOG, AT WWW.BUILDERONLINE.COM/PRODUCTS OR EBUILD.COM.







PRODUCTS



MOD SOD: A green roof often involves complicated work, but this modular system streamlines the process. It consists of 2-foot-by-2-foot anodized aluminum modules containing drought-resistant sedum. Materials may be planted in up to 12 inches of engineered growing material and may weigh from 12 pounds to 51 pounds per square foot depending on the depth of soil. ■ **Green Roof Blocks. 314-972-8010. www.greenroofblocks.com. Circle no. 109.**

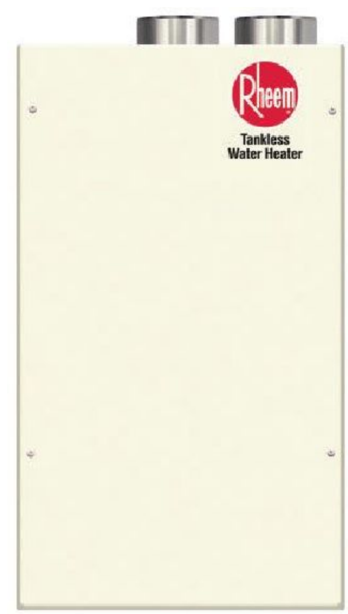


EXTERIOR GRADE: The exterior version of the manufacturer's Aura line has a low-odor formulation and low volatile organic compounds. The product uses technology that encapsulates color pigment in resin, resulting in long-term resistance to fading, mildew, and weather, the company says. It's available in three finishes and thousands of colors. ■ **Benjamin Moore & Co. 201-573-9600. www.benjaminmoore.com. Circle no. 110.**

PAPER CHASE: WallSeal is a sprayed-in-place insulation that eliminates the voids and air pockets common with other insulation materials. The manufacturer says the density is more consistent than other types of insulation products and claims that it will not settle in the wall cavity. The product is made from 100 percent recycled paper. ■ **Nu-Wool. 800-748-0128. www.nuwool.com. Circle no. 108.**



NO TANKS: Designed for today's tightly constructed homes, this direct-vent tankless heater provides 7.4 gallons of hot water per minute. The 82 percent–efficient product draws combustion air directly from the outside rather than from the interior, which prevents indoor air quality problems. It can be set from 100 degrees to a maximum of 140 degrees and comes with a remote control thermostat. ■ **Rheem Manufacturing Co. 479-646-4311. www.rheem.com. Circle no. 111.**





HARD TOP: EARTHcrete is a family of concrete mixes made from formulas that recycle paper fibers, glass, and ceramics taken from municipal waste landfills, and industrial by-products such as fly ash. The formulas vary according to the performance required for specific applications. It can be used for countertops (shown), sinks, and bath fixtures. ■ **Sonoma Cast Stone. 888-807-3201. www.sonomastone.com. Circle no. 112.**

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Home Builders Blitz 2008

THANK YOU

We would like to thank all those in the professional home-building community who have volunteered their time, energy, expertise and resources toward the success of the **Home Builders Blitz 2008.** We recognize that the downturn in the housing market continues to challenge building industry professionals. Thanks to their selfless efforts, however, hundreds of families will realize their dream of homeownership.

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NATIONAL BEAT

NEWS FROM HOUSING'S GROUND ZERO ■ EDITED BY CLAIRE KOLTKO

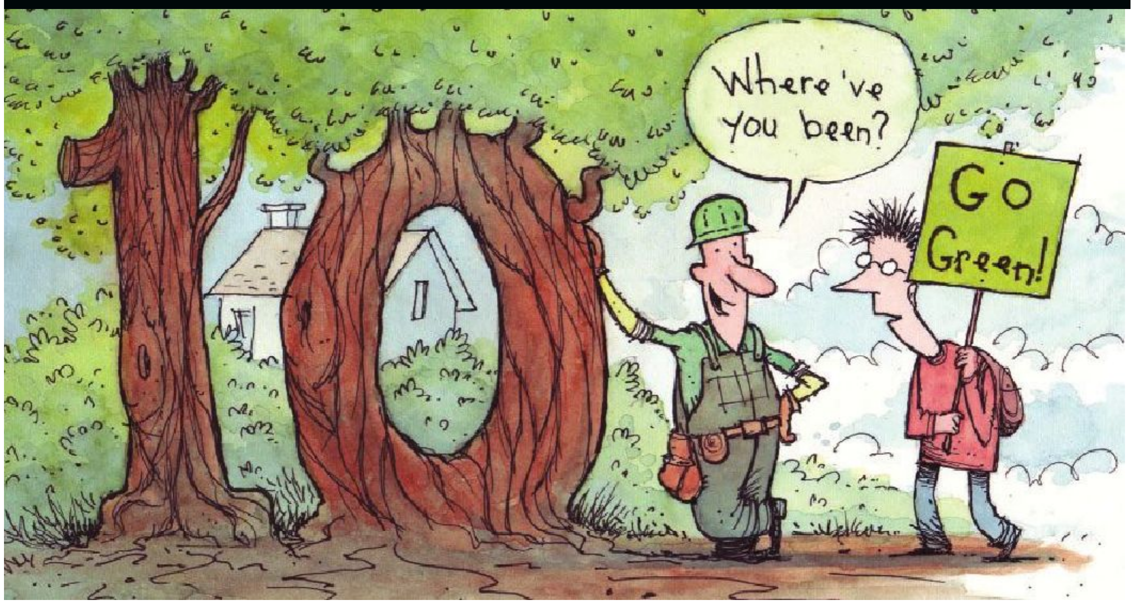


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NAHB BRIEFS

High Energy

Patrick Moore, cofounder of Greenpeace, has long been a leader in green innovation in home building. He recommends a number of approaches that are often not included in renewable energy



mandates including geothermal energy, hydroelectric power, and nuclear energy. The dangers of nuclear power have been exaggerated, he said at the NAHB National Green Building Conference in New Orleans earlier this year, adding that nuclear waste can be "safely and securely contained."

Tighten Up

A recent snapshot of builders and developers in a survey by the NAHB Economics Group has found that acquisition, development, and construction (AD&C) credit has tightened since last year. Also, while not a majority, significant numbers of builders and developers have been asked to pay down outstanding AD&C loans, according to the study. More than 80 percent of all respondents reported that the availability of new credit for land acquisition ▸

FROM THE PRESIDENT

New to Who?

For years, home builders have led the charge for green and energy-efficient innovation.

Admit it. We home builders are a pretty conservative crowd. And yes, we are cautious about embracing new technologies, techniques, and products until they are proven to be superior. But we know emerging trends when we see them, and when we know that something is the right thing to do, we make sure it happens.

That's why the annual NAHB National Green Building Conference celebrated its tenth anniversary this year rather than its first. And it's the reason the NAHB has invested countless member and staff hours and millions of dollars in developing the voluntary National Green Building Guidelines, Program, and Standard, which are collectively known as NAHBGreen.



SANDY DUNN
PRESIDENT, NAHB
WASHINGTON, D.C.

Through NAHBGreen, builders can construct homes with features that are tailored to their local climate and are energy- and resource-efficient as well as affordable. And looking to the future, that's exactly what consumers will want. A member survey released during the recent National Green Building Conference in New Orleans shows that green home building will compose between 12 percent and 20 percent of the market in the next five years as consumers demand and purchase more resource-efficient homes.

That's confirmation of what I'm seeing, even as our industry endures a less-than-stellar housing market.

Our green building staff in Washington constantly fields phone *(see page 60)*

calls and e-mails from members asking about how the NAHB National Green Building Program certification works. And our state and local HBAs are forming affiliated green councils and programs so fast that it's hard to keep track of them.

Green home building will compose between 12 percent and 20 percent of the market in the next five years.

Before we ever heard about carbon trading systems and alternative energy investments, home builders were devising ways to construct a more efficient building envelope for a tighter house and a lower utility bill. And our suppliers and manufacturers were creating more efficient, easier-to-use insulation products and appliances that use very little electricity.

Homes today are significantly more resource-efficient than in the past, as reflected in engineered-wood products, low-E windows, panelized construction techniques, and other innovations.

About 30 percent of the nation's energy is consumed by homes for heating, cooling, and electric appliances. The NAHB has long recognized that energy efficiency is crucial to our nation's continued security and to our economy. Additionally, builders know that building with energy conservation in mind is practical—and it's profitable.

Our developer members continue to design communities that incorporate walkable neighborhoods and shared open space. Our engineer members continue to discover innovative methods to direct stormwater runoff and reduce pollution in rivers and streams. And professionals throughout the home building industry have stepped up to help mitigate the causes of global warming.

For years, we haven't called these efforts green building. We've called them responding to market demand; as an industry and as an association, that's what we will continue to do.

The U.S. population is not going to stop growing, and Americans will continue to need places to live that are comfortable and resource-efficient. It's up to us to continue to innovate to meet demand, just like we have for years. **B**

THE NAHB RESEARCH CENTER CORNER

A Greener Standard

The National Green Building Standard is working toward ANSI approval.

In a continuing effort to advance the use of environmentally responsible techniques and technologies in residential construction, the NAHB, the International Code Council (ICC), and the NAHB Research Center are close to attaining final approval for an American National Standards Institute (ANSI) standard for green home building construction practices. After completion of the ANSI process, the National Green Building Standard will be promulgated as a joint publication between the NAHB and ICC.

The standard defines the way that land can be developed as an integral part of a total green community and provides a scoring mechanism for having developments certified green. Builders and developers will be able to get their existing or new developments certified green while choosing from a wide array of options such as natural features, topography, and landscaping to accomplish a green development.

Land development techniques that cluster homes in proximity to each other and preserve trees, wetlands, and other natural amenities can be very attractive to potential home buyers, can limit the environmental impact of residential projects, and can score points in the green certification process. With a green development, developers can expect to see an increased ability to sell land to their builder customers; builders will enjoy the benefits of an increased customer base; and the community at large will benefit from the decreased impact on the environment.

Once the standard is available publicly, many types of projects including multifamily buildings, remodeling, and subdivisions will be able to be certified green under the National Green Building Certification Program. Currently, only single-family homes can be certified under the national program. The Online Green Scoring Tool—located at www.nahbgreen.org/ScoringTool.aspx—is the first step builders and developers can take to evaluate their existing or proposed projects. The scoring tool provides information about the why and how of green building at every step.

For a draft of the National Green Building Standard, visit www.nahbrc.org. For more information on the National Green Building Certification Program, call 877-NAHB-GRN (877-624-2476).

NAHB BRIEFS

and land development has tightened this year compared to the second half of 2007; 69 percent of respondents said that credit has become more constricted over that time for single-family construction loans; and 29 percent responded that loan availability remained about the same.

Bigger is Better

Although no big builder has gone green nationwide to date beyond levels close to those provided under the Energy Star program, large builders are the most likely to bring down the costs of building green, define



opportunities, and identify problems for the industry at large, David Cohen, division president for K. Hovnanian Homes, told the NAHB National Green Building Conference in New Orleans on May 12. Green can be profitable, Cohen said, and "large builders will be able to help generate the profits everyone can benefit from." Certain products that seem expensive today can become more inexpensive once large builders generate a higher volume of them, he said, with costs coming down as much as 30 percent to 50 percent.

Recipe for Recovery

The U.S. housing market has moved some distance on the road to recovery, but there still are vital steps that must be taken. **BY DAVID F. SEIDERS**

THE UNSUSTAINABLE HOUSING BOOM that peaked around the end of 2005 paved the way for the worst housing bust since the 1930s. Home sales and housing production have been falling rapidly for more than two years. Record-high inventories of unsold homes, a legacy of the finance- and investor-driven boom, have been putting strong downward pressure on house prices. And the price reversal has decimated mortgage credit quality, leading to the disintegration of major parts of the mortgage finance system and provoking serious tightening of credit conditions for builders and developers.

The housing bust obviously has been brutal, and it's certainly not over. But a lot of necessary market and regulatory adjustments have been made during the bust, paving at least part of the way to a systematic housing recovery.

The essential first step in the recovery process will be stabilization of net home sales (new orders less cancellations), and that will require restoration of housing affordability as well as willingness of prospective buyers to go ahead with home purchases. The stunning price declines of recent times, along with persistent growth of household income and improvements to prime mortgage interest rates, have lifted standard measures of housing affordability from the extreme lows of 2006 to levels that prevailed in early 2004. We're also seeing substantial declines in ratios of house prices to residential rents.

The improvement in affordability measures and the decline in price-to-rent ratios have not yet revived home sales. Surveys of consumer sentiment show little improvement in household assessments of overall home buying conditions despite rising proportions of consumers that view lower house prices as a positive development. On that theme, the NAHB's surveys of builders have revealed deeper and more frequent price cuts, but the proportion of builders rating price reductions as effective has not risen significantly.

Home sales have been held down to some degree by rising consumer concerns about the weakening job market and surging energy costs, and expectations of further house price declines are holding back many prospective buyers. Furthermore, tightening non-rate mortgage lending standards are filtering out many willing prospects that look viable under standard affordability calculations.

"The essential first step in the recovery process will be stabilization of net home sales ... and that will require restoration of housing affordability as well as willingness of prospective buyers to go ahead with home purchases."

The tightening of conditions in mortgage finance now appears to be mostly behind us, and the system now depends very heavily on fixed-rate loans that can be sold to the secondary market government-sponsored enterprises (Fannie Mae and Freddie Mac) or that can be insured by the FHA. These sources should be able to handle growing demands for credit down the line, particularly if enhancements being debated on Capitol Hill become law.

Improved affordability conditions and a restructured housing finance system are essential to a recovery in home buying, but special measures apparently are needed to overcome the reluctance of qualifying buyers to go ahead. A temporary tax credit for home buyers, now under consideration by Congress, would be an effective way to jump-start a housing market that is poised to move ahead. **B**



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The Greener

A radical shift toward sustainable practices may be the housing industry's saving grace.

After an EF-5 tornado ripped through Greensburg, Kan., in May 2007, destroying more than 900 homes along with the majority of its civic buildings, schools, and infrastructure, the town's leaders and citizens resolved to do something remarkable. They set in motion a plan not just to rebuild, but to come back, in the words of Mayor John Janssen, as "one of the greenest towns in America." Municipal buildings designed to consume 42 percent less energy would set the tone for subsequent residential and commercial rebuilding.



ISTOCK

BY JENNY SULLIVAN, NIGEL F. MAYNARD, TED CUSHMAN, AND PAT CURRY

Good

One year later, all eyes are on Greensburg as it struggles not only with the mechanics of recovery, but also those of wholesale reinvention. Redevelopment efforts have been slow to move from theory to practice, and some frustrated survivors have ditched their temporary shelters and left town to find other places to live. But those who remain seem steadfast in their conviction to make something good out of a horrible situation.

It's an apt metaphor, perhaps, for the thousands of home builders now struggling to emerge from the wreckage of a collapsed housing market. Inevitably, some builders have left the industry, but indications are that a growing number of those still standing are seriously rethinking business as usual, and how they might make their livelihoods not only more economically, but also environmentally sustainable.

This may well be a watershed moment for the home building industry. Whether change is being driven by legislation, buyer demand, economics, or altruism, it is happening. In this special report, Builder reached out to some of the nation's foremost green experts to aggregate best practices in land use, residential building design, construction, and marketing. These are ideas that are ripe for the picking.

Some have credited the housing industry with singlehandedly bringing the U.S. economy to its knees. If that's the case, then the rule of inverse proportion must also be true: An industry with that much influence must also have the power to do massive good. Imagine the possibilities, and start building them.—*J.S.*




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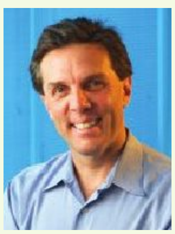
Getting There From Here

Plenty of builders have the desire to build more sustainably but just aren't sure where to start. BUILDER *asked a handful of experts to weigh in on the subject.*

"Previously there was this idea that if you lived off the grid in cabins in the woods and created your own energy, that was the best way to live environmentally. More recent research demonstrates that higher-density urban living actually has the lowest carbon impact per capita."—June Williamson, Professor of Architecture, City College of New York

Douglas Farr

Principal, Farr and Associates



"People love a green building, but they don't really want to hear that their building is in the wrong place. I think for many people who are focused on green buildings as stand-alone objects, urbanism is an inconvenient truth. Buildings have a contribution—arguably the biggest slice of the energy pie in terms of reducing carbon—but we also need to back up and focus earlier on where we are settling. Are there mixed uses there? Is the building needed? Does it contribute to a sense of place? The green WalMart that people drive up to 50 miles to get to is a kind of symbol of absurdism of the green building movement. It's the hood ornament of the end game of auto dependence."

John Norquist

Former mayor of Milwaukee; President and CEO, Congress for New Urbanism



"It makes sense for the home building industry to look at a more urban development pattern, whether it's an infill opportunity or a greenfield development that's based on streets and blocks rather than cul-de-sacs. It's a way for builders and developers to get more value per acre, and it might be a way to save the American Dream. For production builders, making the transition to a more urban product may be the way to save the business, as opposed to being risky. The bigger risk may be for them to keep doing what they've been doing."

Joel Kotkin

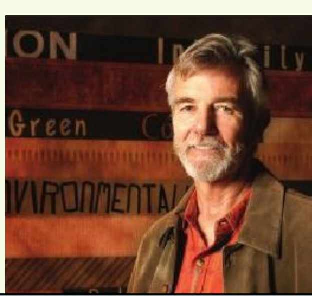
Author and Futurist

"The real issue is not that people want only density or only isolation. What they really want is a spacious place to live, probably with some sort of a yard and the ability to walk to something. That's really what they want and that is really hard to get, but there are ways to get closer to it. Maybe you have single-family homes but they are on smaller lots and you are a five-minute drive to where you shop, so you can also ride your bike there or walk if you have the time. There are lots of middle-range options. Sometimes the best is the enemy of the good."

Kevin deFreitas

Principal, Kevin deFreitas Architects

"These days, a green home doesn't have to look like a straw bale house or like the person who lives there makes their own clothes out of hemp. Is it possible to do modern aesthetics? I found out [when building my own home] it was really easy to do. I'm not a tree hugger at all and didn't start out wanting to do something like this, but the plan evolved and I started to realize it was too easy not to do. If we don't begin to take care of our resources—namely, water and air—our same lifestyle may not be transferable to our children. In America, the hope and goal has always been to give our kids a life better than our own."



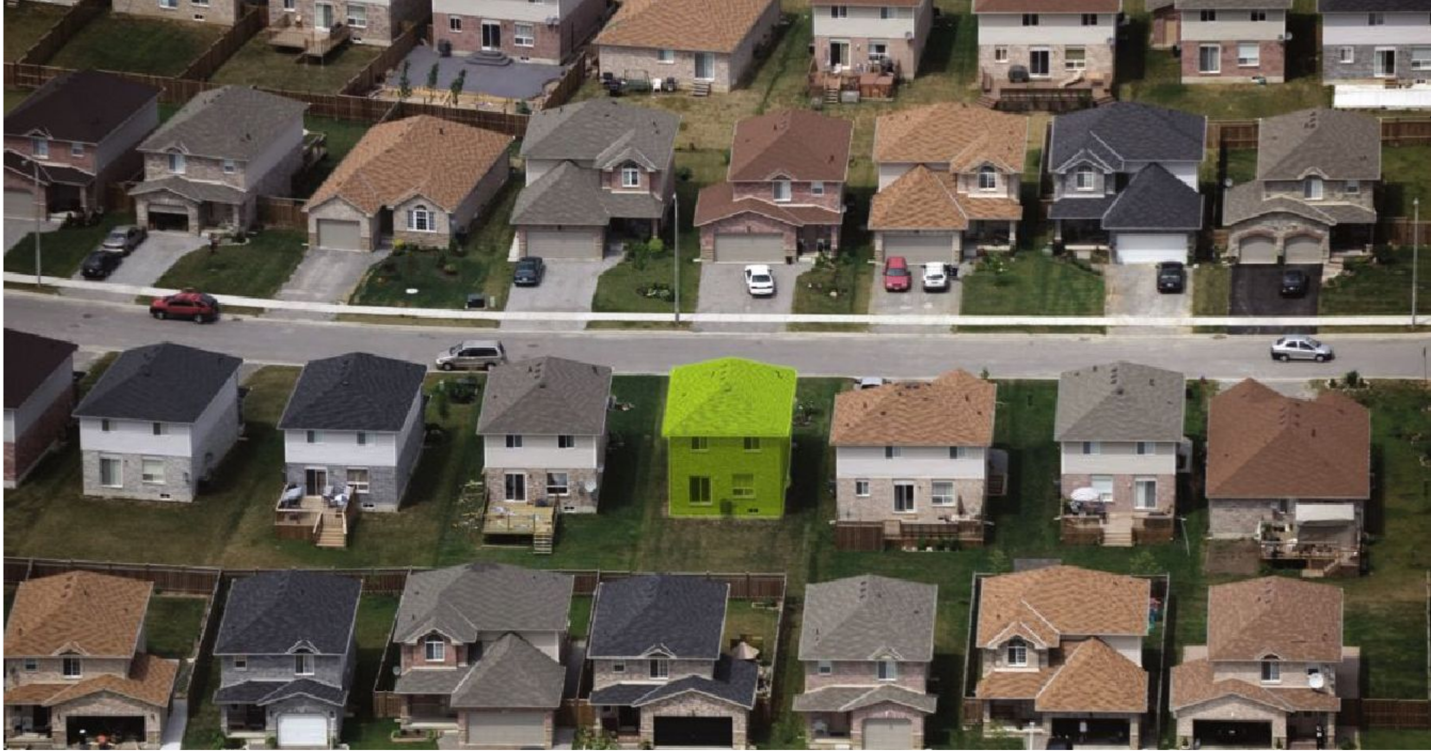
"Clearly people care [about green building]. Our experience is people will pay for it. The real key is you can't give it to them in the form of an option. If Volvo made its safety features optional, people wouldn't choose them. You have to make the commitment to put the package out there."—Tom Hoyt, Co-founder, McStain Neighborhoods







SM



LAND PLANNING

No House is an Island

Is a green-built home in a sea of suburbia truly sustainable?

Experts anticipate that roughly 89 million new or replacement homes will be built in the U.S. over the next 30 years to keep pace with population growth. If sustainability is to become part of the housing pro forma, land use decisions—i.e., where these houses are built in relation to other things—will be just as important as what the homes are made of and how efficiently they operate. The car trips Americans presently rack up traveling between home, work, shopping, and recreation are a hefty source of greenhouse gas emissions—by some estimates a greater offender than homes themselves.

Here's an acronym destined to become a household term in the near future: VMT, or vehicle miles traveled. Since 1980, as cities and their adjoining suburbs have expanded into what Robert Lang, co-director of the Metropolitan Institute at Virginia Tech, refers to as "megapolitan" swaths of contiguous urbanized land, America's collective odometer reading has grown three times faster than its population and nearly twice as fast as vehicle registrations. In their book *Growing Cooler: The Evidence on Urban Development and Climate Change*, authors Steve Winkelman, Reid Ewing, and David Goldberg note that if the nation stays its current course and continues to build auto-dependent subdivisions, an anticipated 48 percent increase in VMT between now and 2030 will easily cancel out any carbon reductions achieved by tougher fuel efficiency standards.

Building more efficient houses and cars is imperative, no doubt, but development patterns also matter in the green big picture, says Winkelman, manager of the Transportation Program at the Washington-based Center for Clean Air Policy. By his calculations, compact-growth patterns can reduce per capita VMT by as much as 30 percent by shortening driving distances and encouraging greater pedestrianism and transit use. "People need to start believing that sidewalks are just as sexy as hybrid cars," he says.

Many planners, local governments, and green-minded builders have already begun to embrace this line of thinking. Designed as alternatives to cul-de-sacs and strip malls, a growing number of new communities that have been sanctioned with progressive zoning codes are mixing a variety of dwelling types and



AS THE CROW FLIES: Conventional, meandering suburban street patterns (left) tend to necessitate longer driving trips and increase vehicle miles traveled, thereby increasing carbon emissions. Compact street grids (right) offer more direct connections and encourage walking as an alternative to driving.

SOURCE: DR. LAWRENCE D. FRANK, BOMBARDIER CHAIR IN SUSTAINABLE TRANSPORT, UNIVERSITY OF BRITISH COLUMBIA

retail/commercial spaces in close quarters with interconnected blocks, shared green spaces, and, in ideal scenarios, public transit.

As these alternative prototypes have begun to take root, much of the apocalyptic rhetoric of a decade ago—most notably, James Howard Kunstler's prediction of the death of suburbia in his 1993 book, *Geography of Nowhere*—has given way to a more pragmatic consideration of how the built environment might be fixed. Walkability and transit access are core components advocated by new urbanists and smart growth-ers, although some experts contend that the first step toward measurable change is to acknowledge that not everyone in America is ready to give up their cars and move downtown.

Joel Kotkin, a Presidential Fellow in Urban Futures at Chapman University in Orange, Calif., notes that 92 percent of growth since 2000 has occurred in the suburbs, and an increasing number of jobs are migrating outside city limits to locations that are not necessarily served by public transit.

"Ultimately, higher energy prices cannot overcome the realities created by the car-oriented declustered environment in which we now live and work," Kotkin wrote in a 2006 op-ed for the *San Francisco Chronicle*. A proponent of what he calls "smart sprawl," Kotkin predicts that while roads will continue to serve as the backbone of the suburban matrix for the foreseeable future, commuting distances will be incrementally reduced as bedroom communities morph into archipelagos of self-sustaining villages that include both housing and employment.

> **The energy used by commuters getting to and from the average office building typically adds up to 30% more than the energy used by the building itself.**
> SOURCE: *ENVIRONMENTAL BUILDING NEWS*

This is a view shared, at least in part, by many of the nation's foremost urban planners. In their forthcoming book, *Retrofitting the Suburbs*, architects Ellen Dunham-Jones and June Williamson forecast the emergence of "urban nodes within a new polycentric metropolis that simultaneously complement the core city's downtown and serve a predominantly suburban population. They reflect both centeredness and decentralization."

In other words, the suburbs seem destined to become more like mini-cities.

While there are inevitable nuances of opinion when it comes to rites of execution (e.g., which comes first, the transit or the housing?), the notion that urban neighborhood models might be used as grafts to reshape the sprawl landscape is gaining traction. Suburban compact growth can have many faces, be it a new urbanist greenfield town, a dying mall transformed into a mixed-use lifestyle center, or a transit village sprouting up around a light-rail park-n-ride. Such projects still account for only a single-digit percentage of the built environment, but they are gaining momentum as a softer alternative to hard-core city life.

> **By 2030, about half of the buildings in America will have been built after 2000. Over the next 25 years, we will be responsible for re-creating half the volume of our built environment.**
> SOURCE: ARTHUR C. NELSON, METROPOLITAN INSTITUTE AT VIRGINIA TECH

"Suburbia as we know it will remain," says Elizabeth Plater-Zyberk, an original founder of the Congress for New Urbanism, partner in the urban planning firm DPZ, and dean of the School of Architecture at University of Miami. "A lot of people will continue to go to great lengths to live that way. We're not talking about eliminating or changing everything, but rather about rethinking the strategy for new growth and providing some alternatives that really didn't exist until recently."

But whether or not the market will shift fast enough to save the ozone layer remains in question. "It's a fairly slow process," says architect Doug Farr, author of the book, *Sustainable Urbanism: Urban Design with Nature*. His firm has joined hundreds of planners, builders, municipal governments, and nonprofits in backing the "2030 Challenge," a campaign with a goal of reducing VMT by 50 percent over the next two decades. "Right now, you've got emphasis on the light bulb and where your gas is coming from and, to a larger degree, whether or not your building is green, but nobody talks about land patterns and walkability as a precondition of sustainability. If you add a green building to sprawl, what have you accomplished? There are half measures everywhere. The whole movement right now is very fragmented, and all of the solutions are partially right."—*J.S.*

LAY OF THE LAND

92%
Rate of population growth in 34 largest U.S. metro areas from 1950–1990

245%
Growth of urbanized land in 34 largest U.S. metro areas from 1950–1990

12,400
Average vehicle miles traveled per household in 1969

21,200
Average vehicle miles traveled per household in 2001

295 million
U.S. population in 2005

378 million
Anticipated U.S. population in 2035

420 million
Anticipated U.S. population in 2050

2.8 million
Acres of blighted grayfields that are expected to become available for redevelopment over the next 15 years

85 million
Metric tons of carbon dioxide that could be eliminated annually between now and the year 2030 by shifting 60 percent of new land development to compact growth

40%
Portion of total office space nationwide that is now located in the suburbs

$250 billion
Cumulative fuel cost savings that would be achieved with a 60 percent shift toward compact-growth patterns by 2030

71%
Share of older households expressing a preference for housing within walking distance of public transit

45%
U.S. share of global automobile emissions

SOURCES: "OUR BUILT AND NATURAL ENVIRONMENTS," EPA; BUILDINGGREEN.COM; ARTHUR C. NELSON, METROPOLITAN INSTITUTE AT VIRGINIA TECH; *GROWING COOLER: EVIDENCE ON URBAN DEVELOPMENT & CLIMATE CHANGE*; AARP

Going to Town

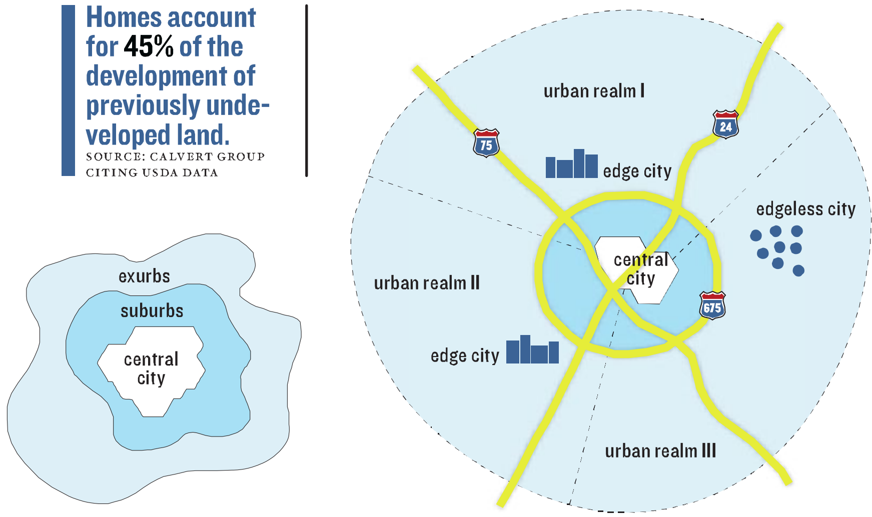
URBANIZED AREAS (INCLUDING CITIES and their suburbs) now house about half of the world's population—a share that is expected to climb to 70 percent by the year 2050, according to a recent U.N. report. By mid-century, researchers predict the emergence of 27 megacities worldwide with populations topping 10 million, compared to just 19 today. The majority of growth is expected to occur in smaller cities, many of which will ultimately spread their borders and bleed into other metro areas. How these pieces of geography and the spaces between them are developed will have a pivotal effect on the earth's well-being.

Urban-style neighborhood design is not a panacea for every locale, but many experts believe it to be a step in the right direction. While cities crank out the lion's share of the world's greenhouse gas emissions (80 percent, largely due to commercial buildings), a per capita assessment of their carbon load is telling. New Yorkers, for example, generate an average of 7.1 metric tons of greenhouse gases per year—two-thirds less than the 24.5 metric tons produced by the average American household. Chalk it up to shared walls, shared infrastructure, shared transit, and lots of walking.—*J.S.*

THE BOOMBURBS COMETH

Urban anatomy as we know it—a dense core surrounded by low-density suburbs and exurbs—may soon be a thing of the past. With the rise of regional megapolitan areas, Robert Lang, co-director of the Metropolitan Institute at Virginia Tech, foresees the emergence of "edgeless cities" and "micropolitan areas" (see illustration below) that will serve as the connective tissue between older central cities. "Urbanizing suburbs represent a tremendous investment opportunity," he advised in a recent presentation. "These places will grab a large share of growth in the next two decades and will rival more distant suburbs as a location for new construction."

Homes account for 45% of the development of previously undeveloped land.
SOURCE: CALVERT GROUP CITING USDA DATA



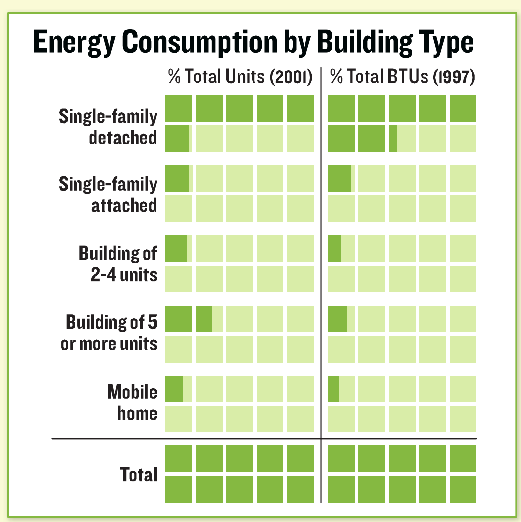
MONOCENTRIC POLYCENTRIC

SOURCE: ROBERT LANG, METROPOLITAN INSTITUTE AT VIRGINIA TECH

HAPPY MEDIUM

Architects and planners often joke that there are two things Americans despise: density and sprawl. But finding a comfortable compromise between the two may be the key to building a more sustainable future. While high-rise developments in the 'burbs will invariably elicit NIMBY protests over property values and traffic congestion, modest mid-rise projects that are more spatially compact (particularly those including core service retailers such as drug stores and dry cleaners) can significantly lower a neighborhood's carbon output by reducing car trips, minimizing energy consumption through integrated building systems, and reducing municipal infrastructure requirements. Attached housing can also help provide the population density that is necessary to support public transit.

While historic sales data suggest that Americans still overwhelmingly desire single-family detached homes in conventional subdivisions, demographic shifts on the horizon may portend a populace that is more amenable to higher-density living. Arthur "Chris" Nelson, a fellow at the Brookings Institution and co-director of the Metropolitan Institute at Virginia Tech, notes that today's households are more likely to be made up of single adults, couples without kids, or single parents. "As we live longer with biomedical advances, the implication for the housing market is that we will be spending proportionately less of our lives raising children," Nelson told the audience at the New Partners for Smart Growth conference in Washington earlier this year. "By 2040, only 13 percent of the net gain in total households will be households with children, whereas 87 percent will be households without kids." Demand for smaller, more affordable, conveniently located homes with smaller carbon footprints may be on the rise.



SOURCE: "TOWARDS A CLIMATE-FRIENDLY BUILT ENVIRONMENT," PEW CENTER ON GLOBAL CLIMATE CHANGE

DENSITY BY DESIGN

What does a sustainable suburban region begin to look like when compact development replaces sprawl? Many planners and researchers predict a shift from the present city vs. suburb dichotomy to a more polycentric landscape in which self-sustaining suburban "nodes" orbit around larger urban cores.



ALL IN ONE

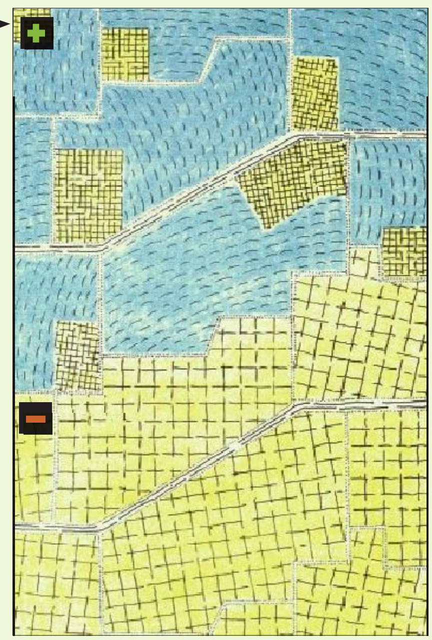
Compact suburban villages have the potential to reduce vehicle miles traveled by putting residences closer to employment, shopping, and recreation. Organic growth is often concentrated around existing or future transit lines.

- **+ Cities and towns made of village-like neighborhoods balance resource needs.**
- **– In suburban sprawl, the city and its suburbs compete for resources.**

POCKET SANCTUARIES

Poor land-use decisions can compromise water quality, reduce vegetation buffers, and degrade wildlife habitats. Zoning reform allowing compact-growth models that cluster buildings together and preserve open space may be one antidote to this trend.

- **+ With compact growth, homes placed on $^1/_6$–acre lots at a density of one unit per acre achieve a landscape preservation ratio of 80 percent.**
- **– Conventional subdivision zoning places homes on one-acre lots at a density of one unit per acre, thus allowing no preservation of open space.**



EFFICIENCIES THROUGH DESEGREGATION

Site planning that places a variety of housing types in proximity to each other can prevent the need for repetitive infrastructure development, which causes further environmental degradation and is a source of burdensome impact fees for builders.

- **+ The urban-style neighborhood allows five market segments to exist in close proximity at one-third to one-half the infrastructure cost.**
- **– Suburban pod development requires major infrastructure build-out to provide for five segregated market segments.**



COMMON GROUND

The automobile-centric model of the post-industrial age put highways and clover-leafs at the center of it all, creating environments that were outright perilous for cyclists and pedestrians. As an alternative, many planners now advocate alternative site designs featuring wide, walkable boulevards, central public greens, and street-activating mixed-use buildings.

- **+ Boulevards lined by mixed-use retail allow the town and highway to work in harmony.**
- **– In auto-centric sprawl development, the highway guts the town.**



ILLUSTRATIONS: COURTESY DPZ

UPlink // TO LEARN MORE ABOUT SUSTAINABLE LAND PLANNING AND TO SEE ADDITIONAL RESEARCH AND COMPACT-GROWTH CASE STUDIES, GO TO WWW.BUILDERONLINE.COM/SUSTAINABLE2008.

Site Matters

NO CONVERSATION ABOUT GREEN BUILDING CAN COMMENCE without a discussion about the site. "[It's] mandatory, from where you put the building to how you handle stormwater," says architect Bill Kreager, principal of Seattle-based Mithun Architects. "It's critical." Long after you've moved on, the site plan will affect home buyers, local wildlife, drinking water, and a host of other issues that many builders don't even think about. The Austin, Texas–based Austin Energy Green Building program says in its *Sustainability Source Book* that the site should get first consideration and be evaluated for all characteristics. It "has a crucial role in future performance of the building and enjoyment of occupants," the group says. Here, then, are some site items to take into consideration.—*N.F.M.*

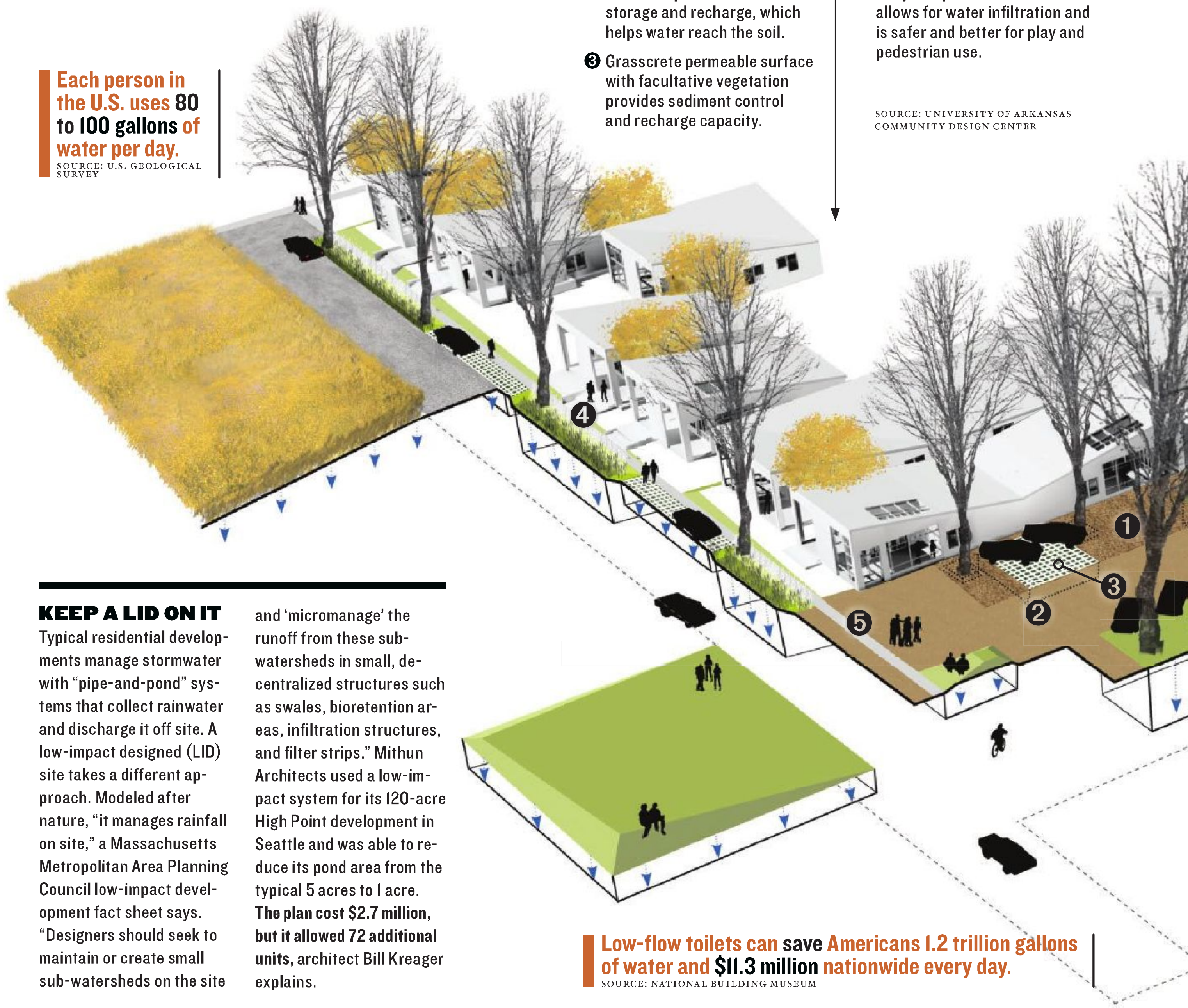
PROMOTE WATER DRAINAGE

The architects at the University of Arkansas Community Design Center say that **up to 47 percent of surface pollutants such as fertilizers can be removed from a site in the first 15 minutes of a storm event and drain into local waterways**. This is not good because much of this rain (or melted snow) runs right into the stormwater system and some ends up in the drinking water. Using pervious surfaces is a better idea because it reduces runoff and manages the water on site. The illustration below shows how the Design Center employed a variety of pervious mechanisms for Habitat Trails, an eco-friendly project of 17 Habitat for Humanity homes in Rogers, Ark.

1. Crushed stone provides a permeable surface, which helps filter stormwater.
2. Porous asphalt aids in water storage and recharge, which helps water reach the soil.
3. Grasscrete permeable surface with facultative vegetation provides sediment control and recharge capacity.
4. Bioswales with facultative vegetation aid in pollutant removal.
5. Recycled pervious material allows for water infiltration and is safer and better for play and pedestrian use.

SOURCE: UNIVERSITY OF ARKANSAS COMMUNITY DESIGN CENTER

Each person in the U.S. uses 80 to 100 gallons of water per day.
SOURCE: U.S. GEOLOGICAL SURVEY



KEEP A LID ON IT

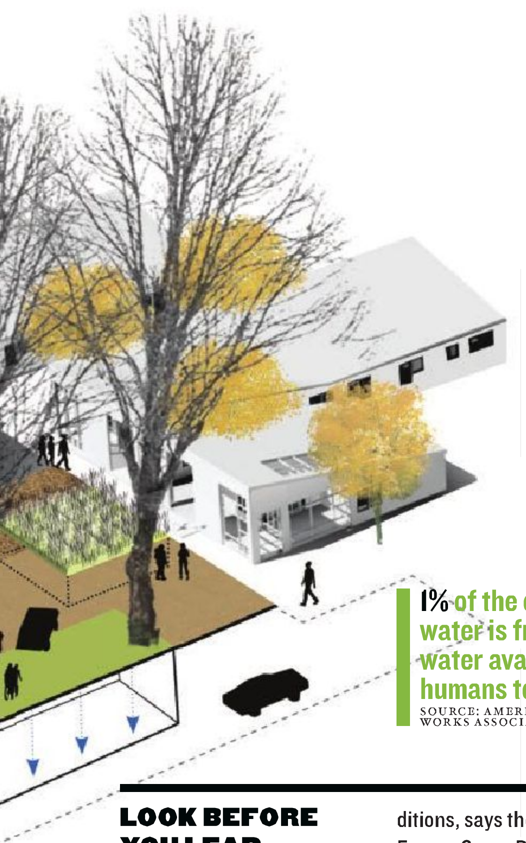
Typical residential developments manage stormwater with "pipe-and-pond" systems that collect rainwater and discharge it off site. A low-impact designed (LID) site takes a different approach. Modeled after nature, "it manages rainfall on site," a Massachusetts Metropolitan Area Planning Council low-impact development fact sheet says. "Designers should seek to maintain or create small sub-watersheds on the site and 'micromanage' the runoff from these sub-watersheds in small, decentralized structures such as swales, bioretention areas, infiltration structures, and filter strips." Mithun Architects used a low-impact system for its 120-acre High Point development in Seattle and was able to reduce its pond area from the typical 5 acres to 1 acre. **The plan cost $2.7 million, but it allowed 72 additional units**, architect Bill Kreager explains.

Low-flow toilets can save Americans 1.2 trillion gallons of water and $11.3 million nationwide every day.
SOURCE: NATIONAL BUILDING MUSEUM

IN THE SHADE

Before any other decision is made, the site should be assessed for "significant shrubs and trees, which help percolate water to the soil," says Langley, Wash.–based architect Ross Chapin. Save as many trees as possible and incorporate them into the site plan, architect Peter L. Pfeiffer adds. **"They provide shade, [act as] good wind buffers, and enhance the marketability of any home or building,"** he says. The Austin Energy Green Building program adds, "Preserving native vegetation can greatly reduce water and pesticide use, and large existing trees add to property value." It also makes sense to save as many trees as possible. "If you completely clear a site, you will need to rebuild what nature provides for free," says Chapin. "Have you seen how much trees cost?" Besides, a neighborhood with mature trees simply looks better.

Toilet flushes account for 28% of the household water usage in the U.S.
SOURCE: AMERICAN WATER WORKS ASSOCIATION



1% of the earth's water is fresh water available for humans to drink.
SOURCE: AMERICAN WATER WORKS ASSOCIATION

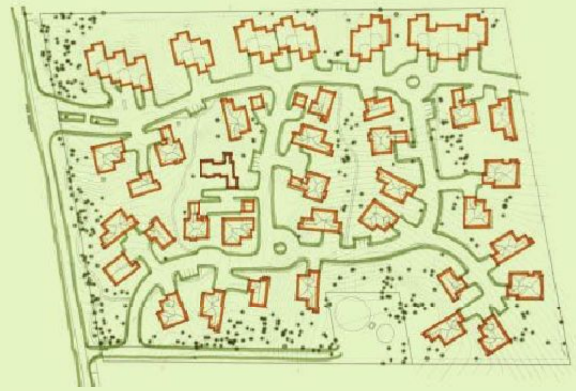
THE GREAT XERISCAPE

How you landscape your houses will affect your buyers a great deal. It could mean the difference between a landscape that requires tons of water and one that's able to withstand drought conditions. "You can reduce landscaping time and your customers' water bills through xeriscaping," says the Partnership for Advancing Technology in Housing. **"Disturb as little existing vegetation as practical and choose drought-tolerant native plants."** Vegetation that corresponds to the local rainfall patterns is low-maintenance, requiring less water. Additionally, says architect Peter L. Pfeiffer, "A thicker layer of topsoil will mean a lawn will require less watering." The U.S. Green Building Council says effective landscaping design could also reduce heat build-up near houses.

LOOK BEFORE YOU LEAP

It's easy enough to clear land and drop in as many houses as possible. Surprisingly, this may not be the smartest approach nor the most cost effective. Meticulous planning is better. Before anything else, thoroughly analyze your site for ecological and anthropological conditions, says the Austin Energy Green Building program. It takes a little more time, but it's worth it. "General climatic data (insolation, temperature, humidity, and wind patterns) should be analyzed in conjunction with specific site elements (i.e., topography, vegetation, water conditions on site, existing built forms, and natural drainage patterns) in the selection of building location, orientation, form, envelope construction, and size and location of apertures," the group advises. **For example, if you use a site's natural wind patterns you could greatly reduce cooling bills in the summer,** says Peter L. Pfeiffer of Austin-based Barley & Pfeiffer Architects.

WHAT EXACTLY DOES GOOD LAND PLANNING LOOK LIKE?



THE OLD WAY: STRUGGLING FOR APPROVAL, A DEVELOPER APPROACHED ARCHITECT ROSS CHAPIN FOR A BETTER WAY TO PLAN THE HIGHLANDS NEIGHBORHOOD.

- 14 acres, 46 units in Langley, Wash.
- Sprawling monoculture of three-bedroom ramblers with front-loaded three-car garages
- Little relation to the contours of the site, sun, or views
- Site layout did not respect need for privacy between houses
- Housing types targeted only two markets
- Layout did not promote community



A BETTER WAY: WITH WIDE SUPPORT— AND APPROVAL

- 14 acres, 53 units
- Smaller "pocket neighborhoods" within the larger development
- Clusters of six to 12 houses around shared landscape area
- Streets faced with porches and no garage doors or driveways
- Automobiles access individual lots by walkable alleys
- A large variety of open spaces, including landscaped courtyards
- 75 percent of existing trees preserved
- No house over 2,500 square feet
- A variety of housing types, including singles on separate lots, backyard cottages, townhouses, and live/work units
- Low-impact designed site with pervious pathways, narrow streets, bioswales, vegetated zones, and native low-water plants

Higher Elevations

No need to get fancy to be green—or greener. And achieving an energy-efficient house doesn't necessarily have to be an expensive proposition with fancy gewgaws and extravagant fixes. A lot of strategies cost very little and some are essentially free. "You have to pick the low-hanging fruit," says architect Edward M. Binkley, national design director in the Ovieda, Fla., office of BSB Design. The elevation and the building envelope are good places to start. Peter L. Pfeiffer of Austin, Texas–based Barley & Pfeiffer Architects says the primary culprits affecting comfort and energy in most parts of the country are "infiltration of outside air, improper orientation, excess solar heat gain, and internal loads that produce humidity and heat." Check out these exterior strategies that will help your houses perform better.—*N.F.M.*

FACT: The typical U.S. family spends about **$1,500** a year on utility bills, but much of this energy is wasted through drafty doors, windows, and poorly insulated walls.
SOURCE: ENERGY INFORMATION ADMINISTRATION



FACE FORWARD

Few things are as important in green building as where you put your houses on the site in relation to the sun. "It is fundamental," says architect Allison Ewing of Hays + Ewing Design Studio in Charlottesville, Va. In short, proper orientation affects its future performance. "Orient streets in a new subdivision to run east-west as much as possible so that the majority of lots can have either a north- or south-facing front and rear," architect Peter L. Pfeiffer advises. Also orient the building to maximize prevailing breezes. As best you can, put most of your windows on the south side to cut down on heat gain in summer and to allow heat gain in the winter, Ewing says. Ideally, windows should face within 15 degrees of true south to take advantage of solar heating.

COVER UP

Despite all best efforts, you will still need to put some windows on the east, west, and north sides. For those cases, sun screens, shades, or awnings will help, architect Allison Ewing says. The trick is in locating the shading devices on the outside, rather than the inside, to prevent the heat from coming in, she adds. Once the heat penetrates the window, the house will require fans and air conditioning to work harder to cool the interior.

WINDOW DRESSING

Pfeiffer often notes that a single-pane window in the shade is more efficient than an insulated window in direct sunlight. Super insulated low-E windows are not a substitute for common sense techniques such as window shading and solar control. Still, window technology has come a long way; high performance glass, in the presence of good passive strategies, will make your houses highly energy efficient.

Crude oil in May 2003 ➡ **$27.38 per barrel**
June 19, 2006 ➡ **$69 per barrel**
June 30, 2008 ➡ **$143.67 per barrel**
SOURCE: NEW YORK MERCANTILE EXCHANGE

GO DEEP

Like a hat or an umbrella, a roof keeps a house dry, but it does a lot more than that. "Roof overhangs keep hot summer sun from overheating a home and help protect the home from rain," PATH says. "The larger the overhang for windows or doors, the less frequently moisture problems will occur on exterior and foundation walls." In addition to deep roof hangs, also consider a shading porch on the west elevation to help deal with harsh sunlight.

COLOR CORRECTED

The same principles that govern dark- and light-colored clothing apply to your houses as well. In a warm climate, avoid dark siding, trim, and especially roofs. "The roof is the No. 1 heat-gaining product on a house," says architect Edward Binkley. "So look at Energy Star–approved roofing, use metal, or pick the lighter-colored asphalt or fiberglass shingles." Dark roofs also require the use of a radiant barrier to cut down on the heat gain, says architect Peter L. Pfeiffer.

The U.S. consumes almost 9 million barrels of gasoline daily—43% of total global daily gasoline consumption.

SOURCE: ALLIANCE TO SAVE ENERGY



RENDERING: BSB DESIGN

HOW ENERGY IS USED IN THE HOME

Space heating	47%
Lighting and appliances	24%
Water heating	17%
Air conditioning	6%
Refrigeration	5%

SOURCE: ENERGY INFORMATION ADMINISTRATION

SHELL GAME

The construction of a home's walls is very important. As the barrier between inside and outside, the shell is the primary defense against wind, moisture, heat, and cold. It also helps keep the indoor temperature constant. It's important, then, to construct walls for maximum efficiency, which includes adequate insulation, a good vapor barrier (installed based on regional climate), properly flashed windows, and adequately installed siding. Architect Allison Ewing prefers walls constructed with 2-by-6 framing and sprayed foam insulation. "Sprayed polyurethane insulation is especially effective in reducing infiltration and vapor [humidity] flow," says architect Peter L. Pfeiffer. Architects Binkley and Ewing also like panelized construction such as structural insulated panels that create an energy-efficient shell. Panelized systems, the Partnership for Advancing Technology in Housing agrees, can be assembled rapidly on site, cutting cycle times and reducing waste. "They provide superior insulation and are often lightweight, making installation easier."

UPlink // VISIT WWW.BUILDERONLINE.COM/SUSTAINABLE2008 FOR A Q&A WITH ARCHITECT PETER PFEIFFER AND FOR MORE IDEAS ON GREEN DESIGN.

Pushing Toward Zero

WHAT'S IT TAKE FOR A BUILDER TO go green? It starts with a desire to learn and a willingness to push the envelope. Then the company has to make a commitment to apply new ideas and new methods on the job.

There are many paths to sustainable building—a production builder's final choices might not be the same as a custom builder's. Let's see how two builders operating in different market segments are blazing trails for others to follow.

In the suburban market of Madison, Wis., four near-zero–energy houses for the DOE Building America program taught Veridian Homes manager Gary Zajicek's building teams the principles they now implement on scores of Energy Star–labeled, Wisconsin Green Built–certified mid-market homes every year.

In the Finger Lakes region of upstate New York, custom builder Kevin Stack, owner of Northeast Natural Homes, demonstrates advanced concepts on LEED-rated upscale country houses, then applies the lessons learned in his consulting work to subsidized low-income housing in Syracuse. As custom builders, says Stack, "we get to identify innovative and cost-effective measures—and then, part of my business is to make them adaptable and affordable to the low-income community."

Both men are willing to impart what they've learned: Zajicek presents seminars on his company's recycling solutions to local and national audiences; Stack teaches a class on sustainable construction at a local community college and consults for other area builders.—*T.C.*

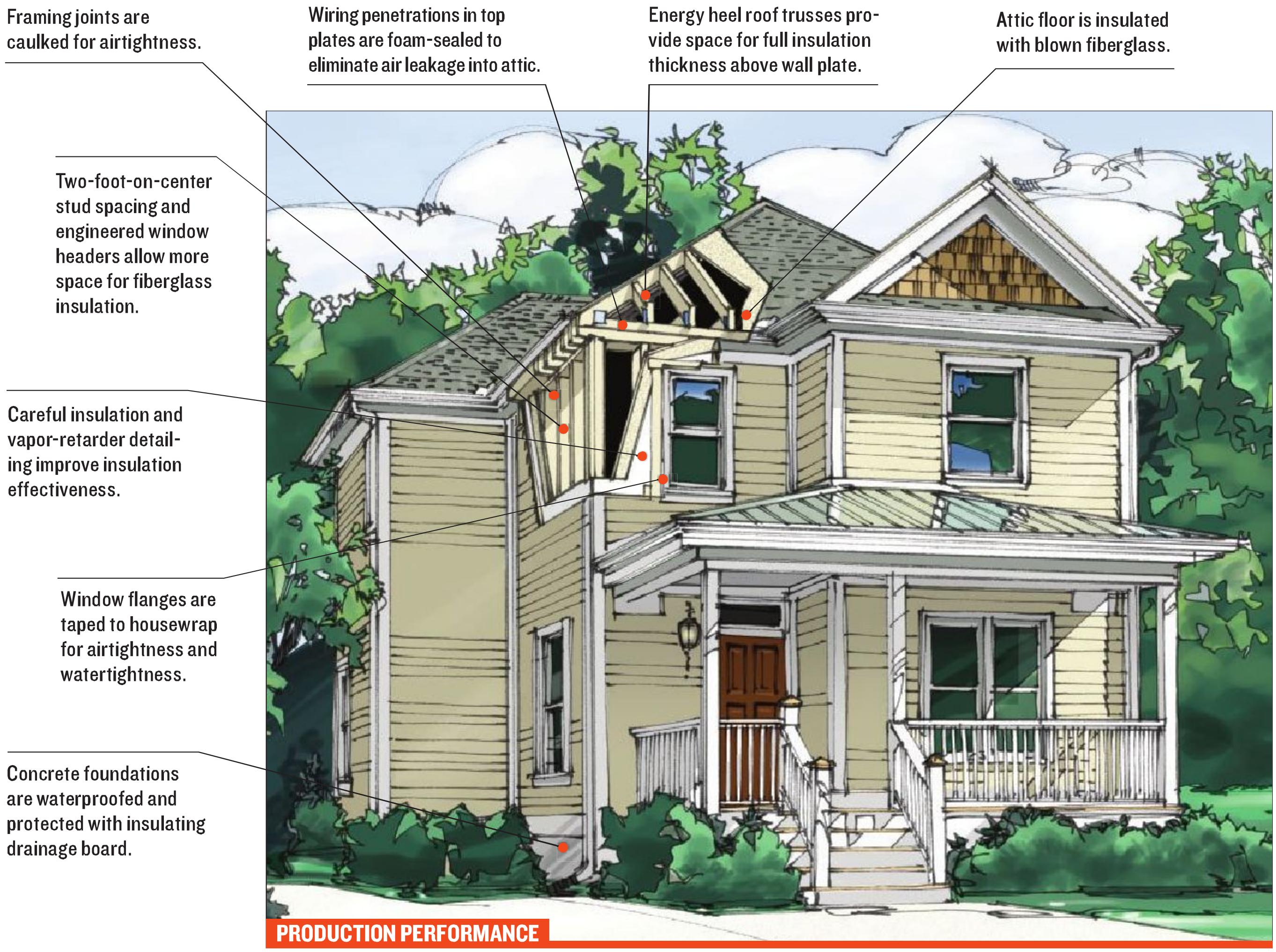


ILLUSTRATION: HARRY WHITVER

QUALITY CONTROL THAT PAYS

For Veridian Homes, successful energy performance hinges on quality control and accountability. Frequent trade ally meetings and comprehensive scopes of work help trades stay on track with effective air-sealing and insulating details. Says manager Gary Zajicek, "That high-quality bath fan will help maintain good air quality while saving energy, but not if it isn't installed right." Zajicek teaches trade contractors to inspect each others' work and to communicate one-to-one in order to keep energy details up to snuff, job after job.

A FOAM FOR ALL REASONS

Kevin Stack insulates and seals his custom homes at the roof plane with high-density soy-based R-6.7 spray foam—which lets him downsize the roof framing to offset the insulation cost. (He also backs out the avoided cost of roof vent details.) "The foam does four jobs at once," says Stack: "air seal, vapor barrier, insulation, and structural stiffener." The insulated ceiling plane keeps heating ductwork inside the conditioned envelope. On affordable projects, Stack specs spray foam just to seal attic edges and ceiling penetrations, then blows in cellulose for an R-40 lid, running mechanical systems inside dropped chases below the main ceiling.

Well-placed mature trees can cut cooling energy use between 10% and 50%, depending on the climate zone.
SOURCE: USDA FOREST SERVICE

KEEPING IT COOL

Preserving existing large trees—even when that means hand-digging around roots—is a high priority for Northeast Natural Homes. "If we have to choose between saving a nice tree or cutting it down to let in light for a photovoltaic panel, often we'll go with saving the tree," says owner Kevin Stack. "Besides the natural cooling effect, that tree will take more CO_2 out of the atmosphere naturally than the emissions the solar panel would avoid."

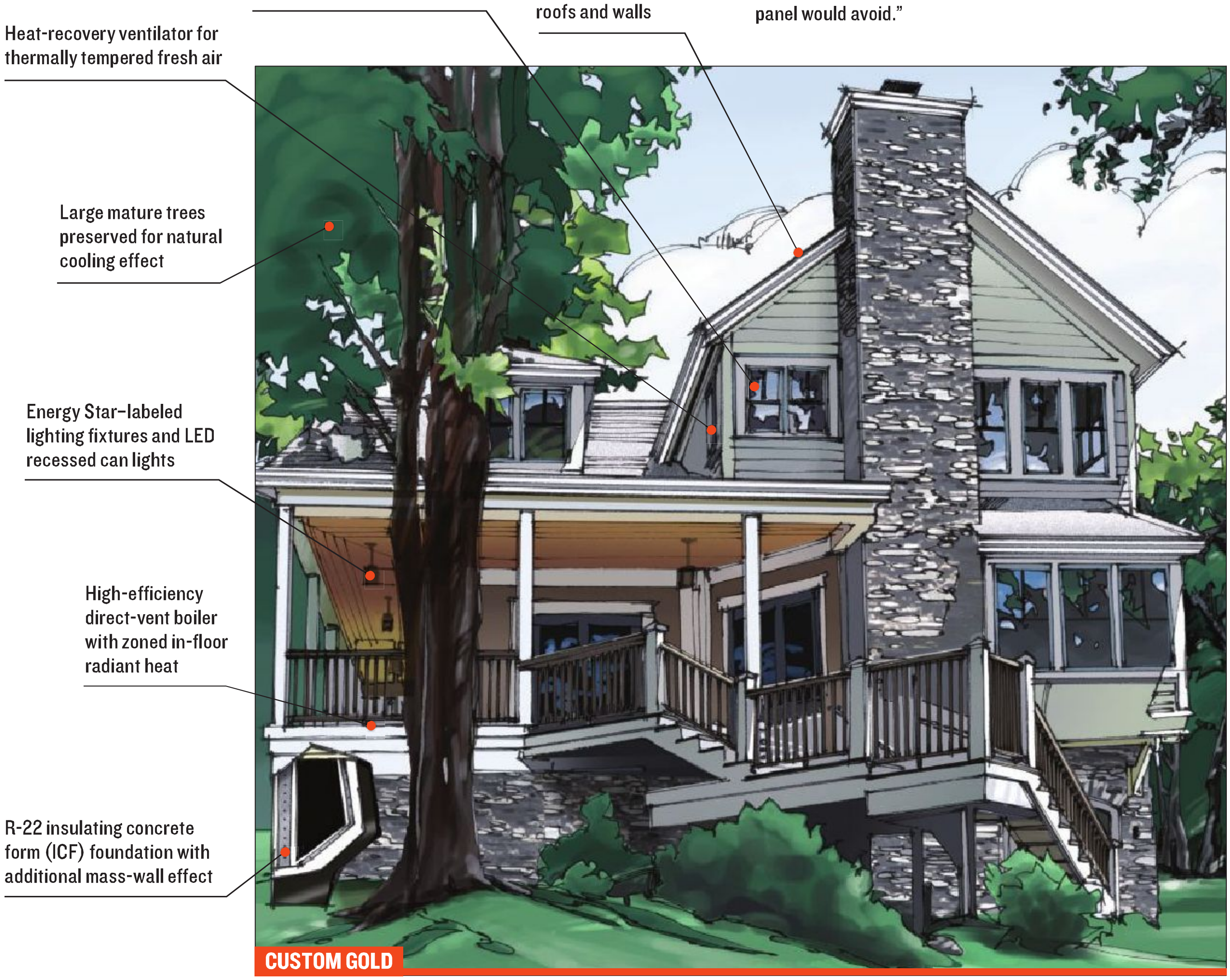


ILLUSTRATION: HARRY WHITVER

DOING THE NUMBERS

An official Home Energy Rating Service (HERS) evaluation is part of any Energy Star– or LEED-rated home. "People always want to know their HERS score," says builder Kevin Stack. "But I like to turn to the second page instead: Okay, that was your score, but this is how much your home will reduce CO_2 emissions over its lifetime. This is how much coal or oil you will avoid using. People are aware of the climate change issue, and they appreciate that kind of information."

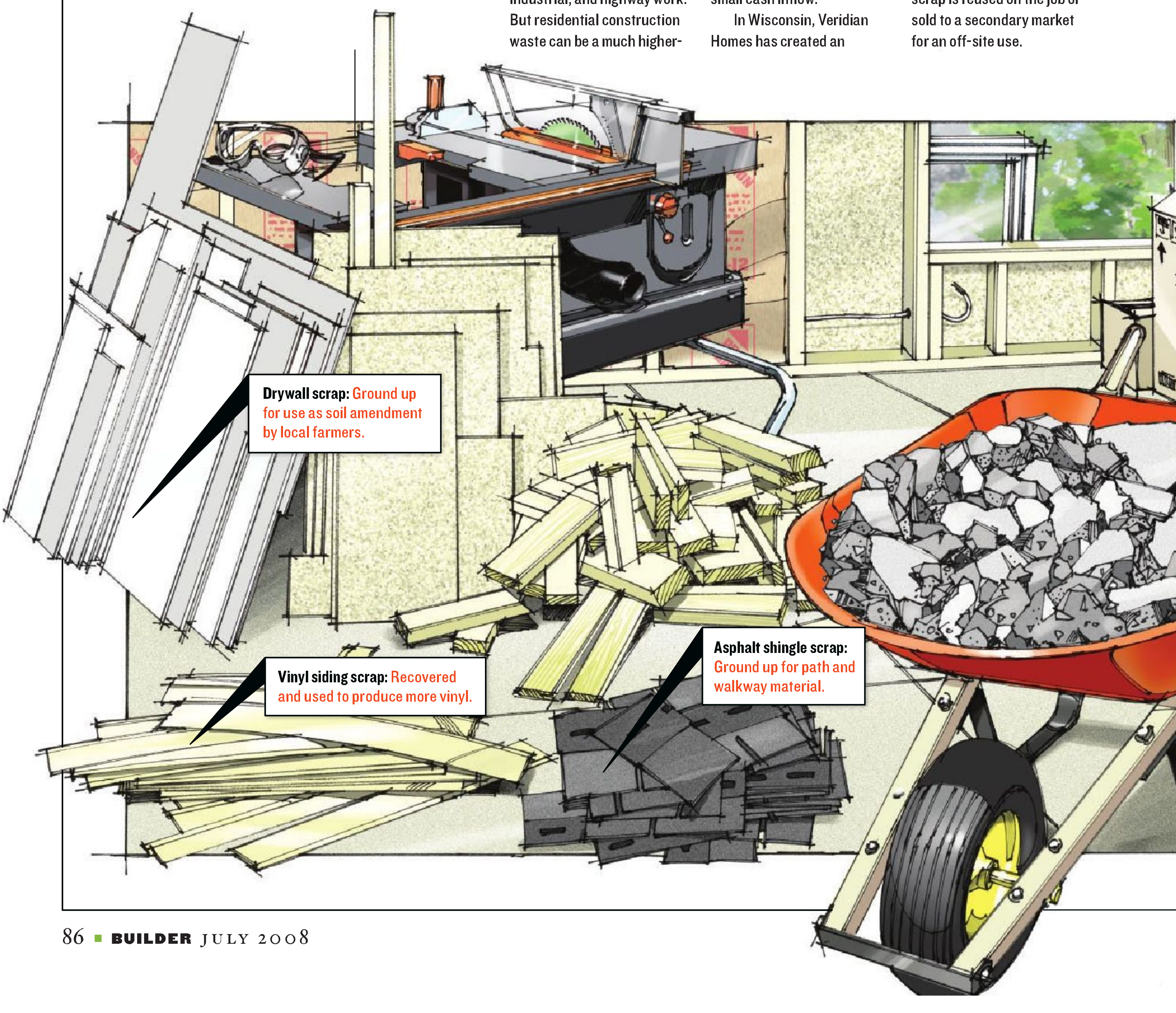
Closing the Loop

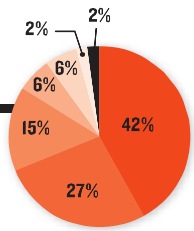
GREEN BUILDERS LIVE BY THE SIMPLE conservation mantra: Reduce, Reuse, Recycle. Take lumber, for example: It's cheap and easy to frame with fewer studs (Reduce). For custom homes, reclaimed flooring made of barn siding or industrial beams makes for a beautiful interior (Reuse). And off-cuts and scraps can be ground up for compost and used for erosion control on site (Recycle). Like complementary species in an ecosystem, production and custom builders have unique strengths in their niches. Big builders can attract bulk users for their scrap, but smaller outfits can more readily incorporate custom touches such as reclaimed wood flooring.—*T.C.*

SLENDERING THE WASTE

New-construction waste is a relatively small portion of the total construction and demolition waste stream (see pie charts, right). Debris from remodeling demolition and whole-building teardowns bulks much larger—even before you include commercial, industrial, and highway work. But residential construction waste can be a much higher-quality resource—instead of dirty, mixed debris, it is mostly clean scraps and off-cuts that are easy to sort and save. That makes it attractive in the market—which spells opportunity for builders looking to cut disposal costs or even generate a small cash inflow.

In Wisconsin, Veridian Homes has created an industry-leading recycling program. The key elements are rigorous jobsite control systems to keep a handle on waste management and extensive relationships with buyers who can use every type of scrap. Result: No material goes to waste—every scrap is reused on the job or sold to a secondary market for an off-site use.

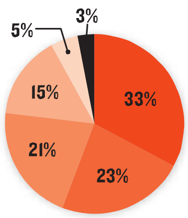




Sample composition of residential new construction debris (average assessment in four locations)

- WOOD
- DRYWALL
- MISC.*
- BRICK
- ROOFING
- PLASTICS
- METALS

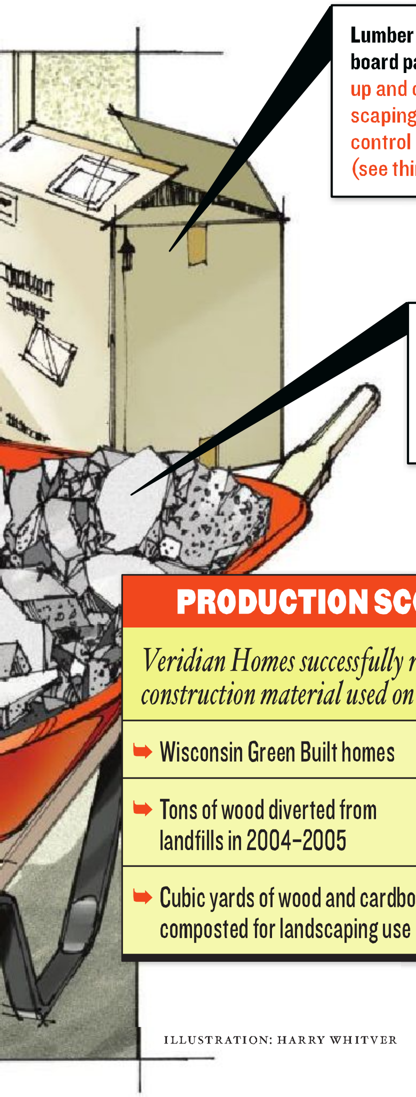
*REFUSE, DIRT, SWEEPINGS, AND AGGREGATE



Generation of construction and demolition debris from buildings

- NONRESIDENTIAL DEMOLITION
- RESIDENTIAL RENOVATION
- NONRESIDENTIAL RENOVATION
- RESIDENTIAL DEMOLITION
- RESIDENTIAL NEW CONSTRUCTION
- NONRESIDENTIAL NEW CONSTRUCTION

SOURCE: NAHB RESEARCH CENTER



Lumber off-cuts and cardboard packaging: Ground up and composted for landscaping mulch and erosion control "Silt Soxx" filler (see third method, right).

Excess concrete: Ground up and reused as aggregate to make more concrete.

PRODUCTION SCORECARD

Veridian Homes successfully recycles every construction material used on its sites. **Results:**

Wisconsin Green Built homes	2,180
Tons of wood diverted from landfills in 2004–2005	4,000
Cubic yards of wood and cardboard composted for landscaping use	30,000

ILLUSTRATION: HARRY WHITVER

KEEPING IT LOCAL—NATURALLY

Custom builder Northeast Natural Homes looks to local and sustainable sources for as much of its construction materials as possible. Local woodlands and quarries supply finish lumber and natural stone. Beams and boards salvaged from old barns supply flooring.

Northeast also uses renewable cork flooring. But for the ultimate in durable comfort, it may forget the wood and just print and stain the concrete slab itself for a finished floor, complete with warm in-floor heat.



Method: Recycle 30 percent power-plant fly ash to replace cement.

Result: Superior concrete, less embodied energy, and reduced landfill impact. (Using stamped, dyed concrete with radiant-heating tubes also avoids the need for wood flooring and finishes, reduces maintenance, and extends the floor's service life.)

"If all the fly ash produced in the world's power plants were used as a cement substitute in concrete production, the CO_2 savings would be equivalent to eliminating 25% of the world's motor vehicles."
—Kevin Stack, owner, Northeast Natural Homes

Method: Reuse old barn boards for wood flooring.

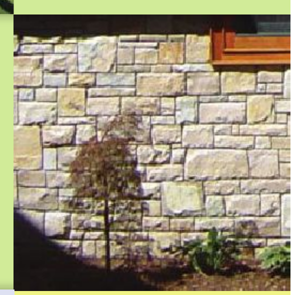
Result: A gorgeous floor with a zero impact on the forest.





Method: Grind up and compost cardboard and wood for use as filler in "Silt Soxx" erosion control fences.

Result: Landfill cost eliminated, trees saved, watershed kept clear of silt runoff pollution.



Method: Build with local natural stone for low embodied energy and unmatched durability.

Result: A striking exterior element that will hold up for centuries with minimal maintenance.



Method: Reduce framing lumber consumption with optimized framing.

Result: 88 studs conserved in a typical house.



Method: Donate excess materials to local Re-Store salvage center.

Result: Avoid disposal cost, reap a tax break, and support the community.

UPlink // TO FIND OUT MORE ABOUT SUSTAINABLE CONSTRUCTION, GO TO WWW.BUILDERONLINE.COM/SUSTAINABLE2008.



Below (top):
Ventral Park by Bennett Homes

Below (bottom):
Magnolia Park by
Steve Burnstead Construction





CREATING BETTER PLACES TO LIVE

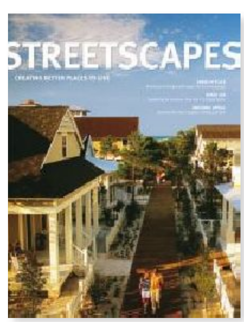
More than simply a financial investment, our homes are the stage upon which we live our lives. Which is why professionals charged with building communities – developers, builders, architects and city officials – are looking at ways to create not only houses but whole neighborhoods that put people first.

This return to traditional neighborhood planning is proving a magnet for homeshoppers who appreciate the attention given to elements such as:

- Walkability
- A sense of place
- Sustainability
- Connectedness
- Interesting architecture

Due to extreme moisture caused by the high rainfall in the Pacific Northwest, successful developers in the state of Washington are embracing innovative building materials. Among those leading the way is Andrew Miller, director of The Dwelling Company.

"We wanted quaint, cute developments, with distinctive colors for the cottages and bungalows. James Hardie siding is a staple for us; it holds paint so well and stands up to all the moisture we get here."



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Getting an Edge

There was a time not too long ago when the phrase, "Build it and they will come," applied to the housing business. That time is past, and builders are now squarely focused on building what buyers say they want in a home. The primary factors in a buyer's decision-making process—location, floor plan, price, and community amenities—are still firmly in place. But a growing percentage of buyers are adding elements of green building principles to their must-have list. Their motives probably have little or nothing to do with saving the planet (see "The Motivation to Buy Green," below)—studies indicate that Americans lag well behind consumers in developing countries in their commitment to sustainability—but they are increasingly well-informed about what constitutes a green house and neighborhood. Builders can establish a competitive edge and reduce their impact on the environment by zeroing in on these buyer preferences.—*P.C.*

THE MOTIVATION TO BUY GREEN

Interest in sustainability is growing, but motives are more personal than altruistic.

Builders have said for years that they'd love to go green, but buyers weren't interested. That attitude appears to be changing. Sustainability has moved to the mainstream, making it a much easier sell.

A global consumer study by the New York–based market research firm TNS released this spring reported that 49 percent of U.S. consumers surveyed were more concerned about the environment than they were five years ago, and 36 percent had changed their behavior recently to benefit the environment.

Moving from the general population to home buyers specifically, a 2007 study on the market for green residential development by Washington-based Robert Charles Lesser & Co. (RCLCO) found that

36.4%

36.4 percent of potential home buyers identified energy savings, health benefits, or the environment as their primary decision-making factor in their next home purchase.

The lion's share of those buyers—21.8 percent—is what RCLCO refers to as Greenback Greens, buyers for whom energy savings is their top priority. They're joined by another 52.2 percent of the survey group who say they care about energy savings and they're willing to spend money on it, but it's not the primary issue in their next home.

The opportunity to save money on monthly power bills—and do something good for the environment at the same time—is an attractive pitch. Emil Morales, senior vice president of TNS, lives in Del Sur, a sustainable community in San Diego developed by Black Mountain Ranch. His house is powered by solar energy.

"What I love is that my electric bill is like $20 a month," he says. "The people in my neighborhood who don't have solar, their bill is $200 to $300 a month."

RCLCO's research, however, found that the Greenback Greens tended to be older with lower incomes and to expect a payback on their investment in less than four years, which is probably unrealistic. Most green builders put the payback period at between six and eight years, and most homeowners move every three to seven years, says Shyam Kannan, RCLCO vice president and director of research and development. The disconnect in the payback periods is why energy savings alone has challenges as a marketing position for green builders.

"To an extent, that incentive will resonate with a certain subset of buyers," Kannan says, "but for the vast majority of people, it's not enough."

Add in health benefits, though, and builders have a message that gets people's attention. In fact, Kannan thinks the biggest opportunity lies with the group RCLCO calls Healthy Greens, those buyers who consider potential health benefits of green homes to be the most important factor in their decision to buy a new home. When asked about their willingness to pay a premium for the health benefits of a green home,

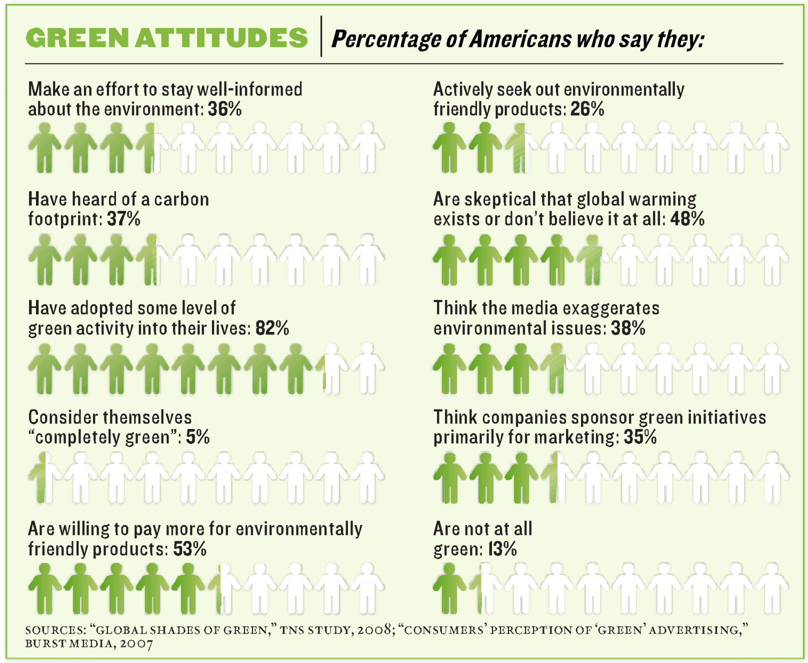
54%

54 percent of Healthy Greens were willing to spend an extra $10,000, 32 percent were willing to spend $17,000, and almost 15 percent were willing to spend at least $20,000—with no expectation of a financial payback.

"When you change the argument from one of saving a few bucks on monthly electric bills to one of limiting exposure to carcinogens, there's a market that extends beyond financial issues," Kannan says. "Our conclusion is that the motivation of personal health was the most powerful message."

It's powerful because it's universal, and it dovetails perfectly with the emotions tied to the decision to buy a home, says Jeff Kingsbury, managing principal of Indianapolis-based green building consultant Greenstreet Ltd.

"If you ask anyone, 'Do you care about the health of your family?' the answer is a pretty resounding, 'Yes,'" Kingsbury says. "That's where successful green marketing has ended up."



BREATHING EASY

A green house changes one family's life.

At 5 years old, Brooke Madden should have been spending her days learning the alphabet, jumping rope, and playing tag on the playground. Instead, the Georgia kindergartner spent most of her time being sick. Severe allergies to pollen sent the Madden family to the emergency room on a weekly basis as the little girl gasped for air. Steroid breathing treatments bloated her little body, and she missed countless days of school.

"You feel so helpless as a parent," says her mom, Jody Madden.

In researching ways to help their daughter, the Maddens learned about the EarthCraft House program, a sustainable building system that improves indoor air quality through sealing air spaces and filtering the fresh air that comes into the house. They put their house on the market and went shopping for a house built to EarthCraft standards.

"When we told people we were selling the house, they thought we were crazy," Jody says. "They said, 'Why don't you just rip up the carpet?' EarthCraft goes above and beyond that. It's a totally different feel to the house when you have all the stuff they put in it for EarthCraft."

The Maddens bought a Haven Properties house in the Windemere neighborhood in Cumming, Ga. Haven Properties builds all its houses to EarthCraft standards and has all its houses certified by EarthCraft inspectors. Since moving in to the house, their lives have changed dramatically, Jody says. Brooke hasn't been to the emergency room once, and she doesn't have to do breathing treatments anymore.

"She's totally fine," Jody says of her daughter, who is now 8. "She's not missing school because of her breathing. She hasn't seen an asthma doctor at all. It's a huge, 180-degree change because she was so sick. We love our house, obviously."



ISTOCKPHOTO

HEARING IS BELIEVING

Atlanta-based Monte Hewett Homes uses a simple, dramatic demonstration to show buyers how blown insulation can give them both energy efficiency and peace and quiet, even in the middle of the city. The company was kind enough to film it for BUILDER. Check it out on **YouTube.com**. In the search box, type in **"Monte Hewett Homes EarthCraft Quality Demonstration."**



"Can you make some money doing this? Yes, because you're serving an underserved market. Can you charge a premium for it? I don't think so because buyers are expecting it."—Shyam Kannan, vice president and director of research and development, RCLCO

SURVEY SAYS ...

What energy-saving features would be important to you to be standard in a new home or new community, knowing that the features will cost more upfront but will save money over time?

Feature	Percent
High-efficiency furnaces and water heaters	53%
Low-E windows	49%
Ceiling fans	45%
Energy Star certification	40%
Energy usage reduction by 20 percent	36%
Water-conserving fixtures and faucets	29%
Low-voltage outdoor lighting	31%
Cross ventilation	29%
Porches	29%
Tankless hot water heaters	25%
Spray cellulose insulation	27%
Solar energy panels	25%

SOURCES: RCLCO SURVEY, "MEASURING THE MARKET FOR GREEN RESIDENTIAL DEVELOPMENT," JANUARY 2008

Marketing the Message

THE GREEN BUILDING STORY CAN be appealing to buyers on multiple levels. The better they understand how the systems behind the walls can impact their lives, the more excited they will be about their new home. Builders who have made a commitment to sustainability say that their marketing efforts focus more on education than persuasion. Sales staffs need to be able to both explain the benefits in practical ways and to answer technical questions—or at least know where to find the answers. The key is to make sure the experience mirrors the message.—*P.C.*

A DIFFERENT APPROACH

John Keith is a true believer in green building. President of Colorado-based Harvard Communities, Keith trained his sales staff to explain the benefits to prospective buyers and had elaborate displays in his sales center. It didn't really work.

"A lot of what we do is pretty boring," Keith says. "Ultra energy-efficient [building] isn't very sexy."

Then, Keith took matters into his own hands and started leading wine-and-cheese tours of under-construction houses for small groups of buyers and prospective customers every couple of months. He walks them through the house, pointing out the dozens of details that go into his homes. During the course of an evening, he says, he watches as people start to grasp the concept and shift from being mildly interested to being raving fans.

"People say, 'Thank you for doing this; I had no idea,'" Keith says.

He's seen first-hand what many green builders know. They don't really save money on marketing. They just spend that budget in different ways.

"A lot of successful green builders will spend less on paid advertising and deploy [those dollars] into public relations, events, referrals, and more interactive on-site displays," says Jeff Kingsbury, who worked for several years at pioneer green builder McStain Neighborhoods and now consults with green builders and developers. "What you want to do is connect with customers on a values basis because you have a richer, deeper story than '$30,000 off.' We've all worked too hard to discount it."

Harvard Communities has generated a substantial amount of positive press by offering a solar option and by completing two near-zero-energy homes that are about 80 percent more efficient than code-built houses.

Keith has noticed a steady change in the public's awareness of green building, which he attributes to the constant media presence of environmental messages. As a result, he says, Harvard Communities had its best two quarters ever "at a time when builders 10 times our size have had almost no sales."

"I think our successes are due in large part to the fact that the word is out on what we're doing," he says. "We see more and more people who are seeking us out because they're hearing about what we're doing and thinking, 'Wouldn't it be great if we had an energy-efficient home?'"





SHOW AND TELL

ICI Homes puts green building front and center with EFACTOR.

Daytona Beach, Fla.–based ICI Homes launched its own green building program, EFACTOR, after extensive research.

"We knew [our green building program] would be a competitive edge," says Judy Lawrence, vice president of customer relations. "Then we asked, 'How do we sell it?'"

To start with, ICI sold its existing models and built 12 new ones. Advertising, including bus wraps, focused on EFACTOR. Brochures feature a checklist to help buyers compare EFACTOR construction to other builders' houses. Seminars and a Web site, www.myEfactor.com, explain the benefits. Plus, ICI guarantees the monthly power bills.

"Mostly, it's been a PR push," says Rosemary Messina, ICI's vice president of sales and marketing. "We get at least two stories a month [in local media]."

The "crowning glory" of ICI's marketing, Messina says, is the Emerald, the showcase home for the local HBA Parade of Homes. It featured eight education stations, including a building science lab in the garage, staffed by ICI employees in white lab coats.

What have the results been? Sales were up 100 percent from 2007 to 2008. Messina attributes a third of that to EFACTOR. ICI identified 55 buyers during the Parade of Homes.

For the remainder of 2008, the show house will host everything from a children's art show to Realtor green building certification classes.

"We want the show home to live all year long," Messina says.



MAKING A SALES CENTER STATEMENT

For green builders, the sales center serves as a place to explain to buyers why they should get as excited about blown cellulose insulation as they do about neighborhood schools and a soaking tub in the master bath.

Austin, Texas–based Green Builders spent considerable time designing its sales center because it needed to be as innovative and sustainable as the builder's houses and neighborhoods.

"The typical builder putting in a sales center in a converted garage spends $30,000 to $50,000 and then throws it all in a dump when they're done with it," says Green Builders CEO Clark Wilson. "We were really struggling with this."

He wound up collaborating with architect John Blood, a professor of architecture at Yale. The result was Studio G. While built on a traditional trailer base, the sales center "looks bigger than it is, which is kind of the point," Blood says. "We have glass where it counts, up front and in the center. The connection to the outdoors and the experience of that is an essential part of the experience. It's different than curling up and saying, 'I'm not going to damage the planet.' You want to live in it."

The center incorporates such green principles as a rainwater-collection system on the roof, solar panels, recycled building materials, and wide overhangs for protection against the sun. And it's reusable.

"It's bolted together in the middle so we can move it from one place to the next," Wilson says. It's currently in use at Georgetown Village in Georgetown, Texas, a community of single-family homes from the $190,000s.

"It's just really, really different," Wilson says. "But that's what you have to do now."

But a green sales center can exist in a garage, too. Atlanta-based Haven Properties, which builds all its homes to EarthCraft House and Energy Star standards, makes good use of cutaways mounted to the garage-based sales center wall to show buyers the elements that will make their home comfortable, quiet, and energy-efficient. In its inventory homes, simple but effective posters spotlight the energy-saving features in each room. That way, prospective buyers can learn as they tour.



UPlink // VISIT WWW.BUILDERONLINE.COM/SUSTAINABLE2008 TO LEARN ABOUT THE ROLE OF THIRD-PARTY GREEN CERTIFICATION AND FOR MORE ON MARKETING SUSTAINABLE HOMES.

GREEN INCENTIVES

Not every builder can guarantee energy savings.

Incentives are a major sales tool in today's real estate environment. To promote green building, the incentives tend to be a bit different.

Louisville, Colo.–based McStain Neighborhoods has offered such incentives as Vespa scooters that get 100 miles to the gallon and a subsidy for customers selecting wind power for their homes. Harvard Communities, based in Greenwood Village, Colo., offered a Toyota Prius Hybrid last year.

The best incentive for green builders, though, appears to be guaranteed energy savings. In a 2007 study, an astonishing 98 percent of buyers told Washington-based real estate market consultant RCLCO they would be more likely to purchase a home with energy-saving features if offered an energy-savings guarantee. One way to accomplish this is through Environments for Living (www.eflhome.com), a program run by Masco Contractor Services (MCS). It guarantees the energy used to heat and cool the home won't exceed a pre-set amount over 12 months. If it does, the homeowner is reimbursed for the difference. The comfort guarantee assures homeowners that the temperature at the thermostat won't vary more than 3 degrees from the center of any air-conditioned room in the thermostat zone, or MCS will identify the problem and coordinate necessary repairs with the builder.



Harvard Communities has offered the guarantee for about three years, president John Keith says. "We've never had anyone call us up and say the house isn't performing," he says.

ICI Homes also offers the guarantee and recently stepped that up even further, offering to pay their customers' power bills for three years. The guarantee was a hit at ICI's recent Parade of Homes show home.

"The biggest thing that got people saying, 'What? Wow!' was our written, three-year guarantee that the cost to heat and cool that 3,400-square-foot house isn't more than $67 a month," says Steve Reeger, ICI's vice president of building science. "Then we turn around and say, 'We're so sure of those energy bills, we'll pay your electric bill for three years.' It was pretty remarkable."




Tyvek

People give to charity for many reasons. We give to keep alive the memory of our daughter and sister who died in a tragic accident in 2003 when she was only 20-years-old. We established the Elizabeth Anton Habitat for Humanity Fund four years ago through the Homebuilding Community Foundation (HCF), and many of my friends and colleagues in the housing industry have made generous donations to the fund in her name.

WHY DO WE GIVE *THROUGH* THE HOMEBUILDING COMMUNITY FOUNDATION?

HCF makes it easy, because we can contribute to Elizabeth's fund at any time; in addition, HCF has managed and invested the funds effectively, so, when we identify a Habitat for Humanity project we would like to support, we can make a generous grant. To date we have helped fund the construction of two homes for families in need in suburban Washington, D.C., and homes for some 15 families in war-ravaged southern Lebanon. This year we will continue to support Habitat's rebuilding efforts in Lebanon and contribute to a Habitat project in Pittsburgh, where Elizabeth's grandmother lives.

Placing Elizabeth's name on our donations helps us keep her memory close to our hearts as we help families in need. While donations from Elizabeth's fund are made in her name, the entire homebuilding industry benefits, because the contributions, in a way, symbolize housing industry's support for good causes in communities across the country.

Frank Anton — CEO, *Hanley Wood*
Emily Anton
Margaret Anton

For information on how you can establish a charitable fund to support nonprofit causes important to you and/or to keep the memory alive of one of your loved ones, please visit: homebuilding.org or contact Judy Everett at 713-333-2200 or jeverett@ghcf.org.

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Barkham Fund
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Ann Danner, Residential Homes of America
Bernard Drueding Donor Fund
Ann & Kevin Dwyer Family Fund
Feldman Family Fund
Tiffany Goodrum Fund
Howard & Joanne Hamamoto Family Fund
Jonathan T. Hill Horizon Fund
Hogan Family Fund
Horne Family Fund
Mori & Forough Hosseini Children's Fund
Katharine & Paul Hylbert Fund
Mazin & Lucy Kalian Family Fund
Robert J. Kinsloe Family Fund
Ted Mahoney Charitable Fund
Dustin Manners Donor Fund
Karen Manners Fund
Thomas Manners Donor Fund
Allan & Tracy Merrill Fund
Bob & Marlene Mitchell Family Fund
Porath Family Fund
George & John Pringle Donor Fund
Antone Raymus Donor Fund
Regis Homes of Northern California Fund
Richardson Family Fund
Roni Hicks & Associates Fund
Nancy & Geoffrey Stack Family Fund
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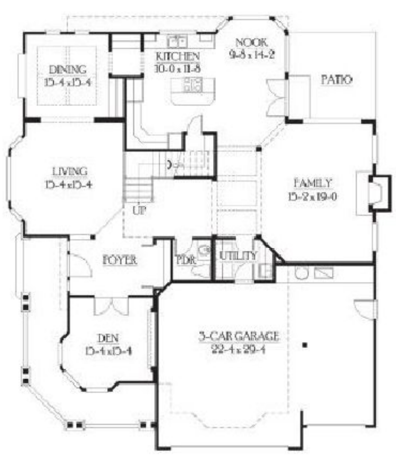
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First Floor: 1,630 sq. ft. ■ **Second Floor:** 1,260 sq. ft. ■ **Total:** 2,890 sq. ft. ■ **Bonus Space:** 240 sq. ft. ■ **Bedrooms:** 3 ■ **Bathrooms:** 2 1/2 ■ **Dimensions:** 59' - 0" X 50' - 0" ■ **Foundation:** Crawlspace

A Craftsman for today's lifestyles, this home has charm and elegance. Its wraparound porch, stone accents, eaves, and bays convey a sense of home. The side-entry garage is perfect for a corner lot. Opposite the den/home office are formal living and dining rooms, linked to the kitchen via a butler's pantry. The island kitchen, bayed nook, and family room create an open living area. A second-floor bridge connects the master wing to the children's wing. Use paneled, wood railings and columns on the staircase for a truely Craftsman touch.

CORNERSTONE DESIGNS, LLC



FIRST



SECOND

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PLAN # HWB9700001 ■ **5-SET** $795 ■ **8-SET** $855 ■ **REPRO** $1,065 ■ **CAD** $1,815



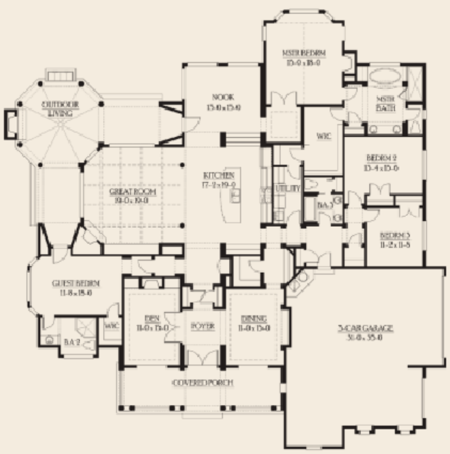
First Floor: 1,735 sq. ft. ■ **Second Floor:** 1,855 sq. ft. ■ **Total:** 3,590 sq. ft. ■ **Bedrooms:** 4 ■ **Bathrooms:** 3 1/2 ■ **Dimensions:** 74' - 0" X 72' - 0" ■ **Foundation:** Crawlspace



FIRST SECOND

PLAN # HWB9700002 ■ **5-SET** $845 ■ **8-SET** $910 ■ **REPRO** $1,145 ■ **CAD** $1,915

Square Footage: 3,500 ■ **Bedrooms:** 4 ■ **Bathrooms:** 3 ■ **Dimensions:** 87' - 0" X 86' - 6" ■ **Foundation:** Crawlspace





PLAN # HWB9700003 ■ **5-SET** $845 ■ **8-SET** $910 ■ **REPRO** $1,145 ■ **CAD** $1,915



First Floor: 1,365 sq. ft. ■ **Second Floor:** 1,155 sq. ft. ■ **Total:** 2,520 sq. ft. ■ **Bedrooms:** 3 ■ **Bathrooms:** 2 1/2 ■ **Dimensions:** 40' - 0" X 52' - 0" ■ **Foundation:** Crawlspace

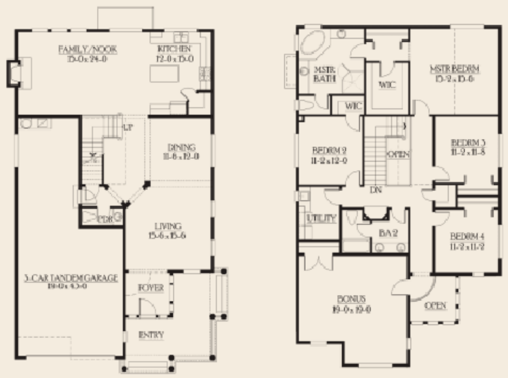


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PLAN # HWB9700004 ■ **5-SET** $795 ■ **8-SET** $855 ■ **REPRO** $1,065 ■ **CAD** $1,815

First Floor: 1,250 sq. ft. ■ **Second Floor:** 1,790 sq. ft. ■ **Total:** 3,040 sq. ft. ■ **Bedrooms:** 4 ■ **Bathrooms:** 2 1/2 ■ **Dimensions:** 38' - 6" X 62' - 6" ■ **Foundation:** Crawlspace



FIRST SECOND

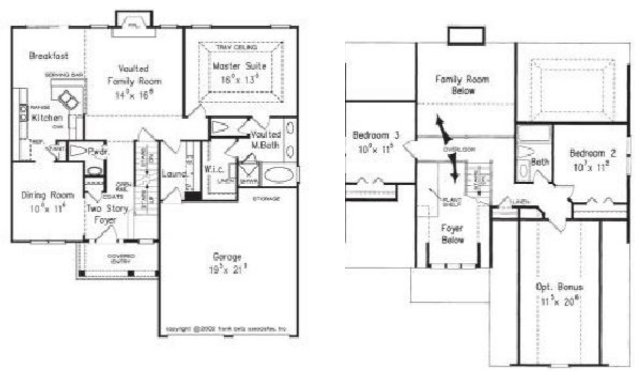


PLAN # **HWB9700005** ■ **5-SET** $795 ■ **8-SET** $855 ■ **REPRO** $1,065 ■ **CAD** $1,815



PLAN # **HWB9700006** ■ **5-SET** $685 ■ **8-SET** $750 ■ **REPRO** $935 ■ **CAD** $1,570

First Floor: 1,177 sq. ft. ■ **Second Floor:** 457 sq. ft. ■ **Total:** 1,634 sq. ft. ■ **Bonus Space:** 249 sq. ft. ■ **Bedrooms:** 3 ■ **Bathrooms:** 2 1/2 ■ **Dimensions:** 41' - 0" X 48' - 4" ■ **Foundation:** Crawlspace, Slab, Unfinished Walkout Basement



FIRST SECOND

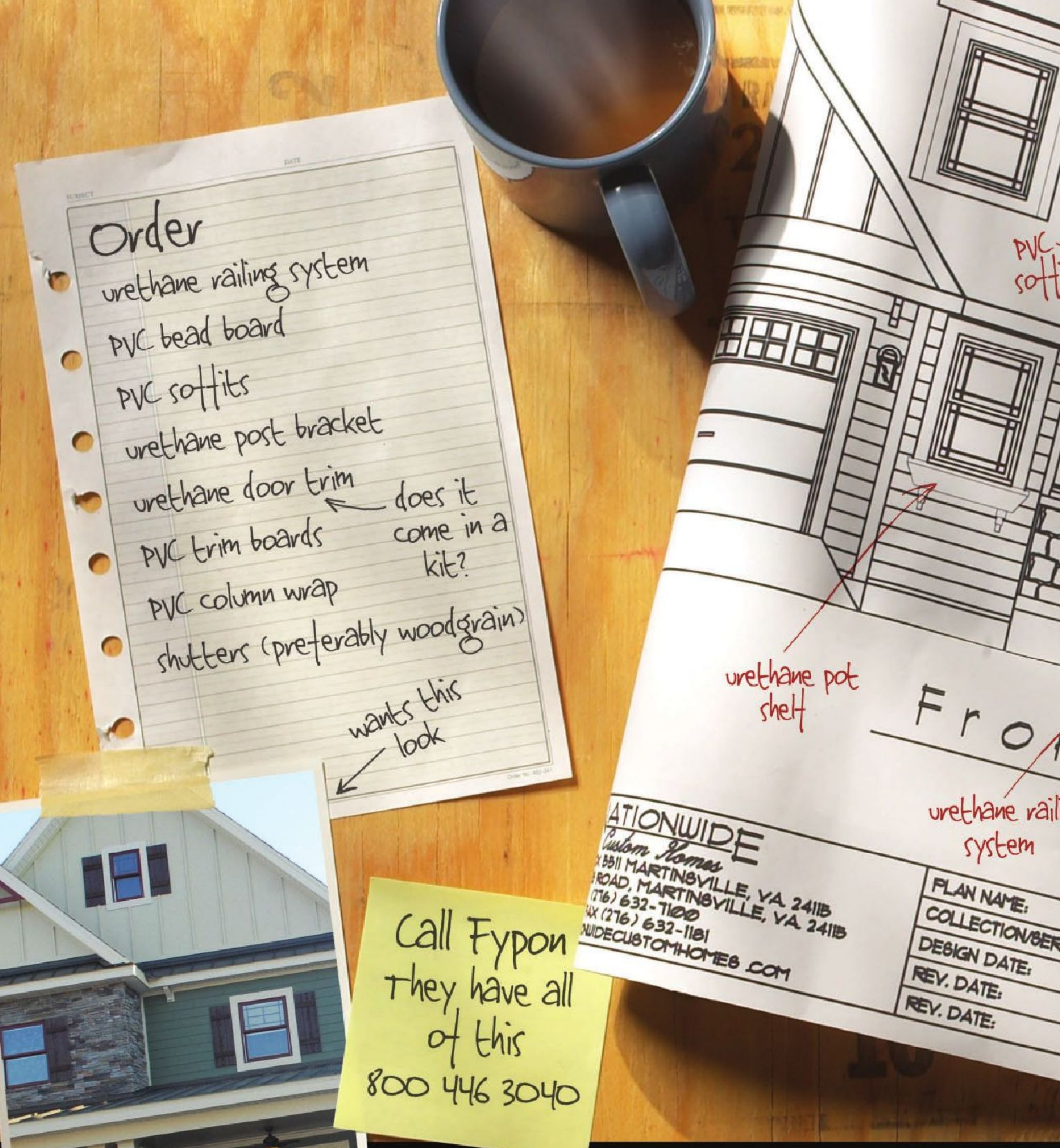
Square Footage: 2,329 ■ **Bedrooms:** 3 ■ **Bathrooms:** 2 1/2 ■ **Dimensions:** 72' - 0" X 73' - 4" ■ **Foundation:** Crawlspace





PLAN # **HWB9700007** ■ **5-SET** N/A ■ **8-SET** N/A ■ **REPRO** $1,397 ■ **CAD** $2,562

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First Floor: 3,072 sq. ft. ■ **Second Floor:** 1,406 sq. ft. ■ **Total:** 4,478 sq. ft. ■
Bedrooms: 5 ■ **Bathrooms:** 4 1/2 ■ **Dimensions:** 75' - 5" X 73' - 11" ■
Foundation: Unfinished Basement



FIRST



SECOND

PLAN # HWB9700008 ■ **5-SET** N/A ■
8-SET N/A ■ **REPRO** $2,462 ■ **CAD** N/A

First Floor: 3,011 sq. ft. ■ **Second Floor:** 1,151 sq. ft. ■ **Total:** 4,162 sq. ft. ■
Bonus Space: 378 sq. ft. ■ **Bedrooms:** 4 ■ **Bathrooms:** 5 ■
Dimensions: 85' - 2" X 81' - 4" ■ **Foundation:** Unfinished Basement



FIRST



SECOND



PLAN # HWB9700009 ■ **5-SET** N/A ■
8-SET N/A ■ **REPRO** $2,289 ■ **CAD** N/A



First Floor: 2,522 sq. ft. ■ **Second Floor:** 1,244 sq. ft. ■ **Total:** 3,766 sq. ft. ■
Bedrooms: 4 ■ **Bathrooms:** 3 1/2 ■ **Dimensions:** 63' - 10" X 70' - 6" ■
Foundation: Slab, Unfinished Walkout Basement



FIRST



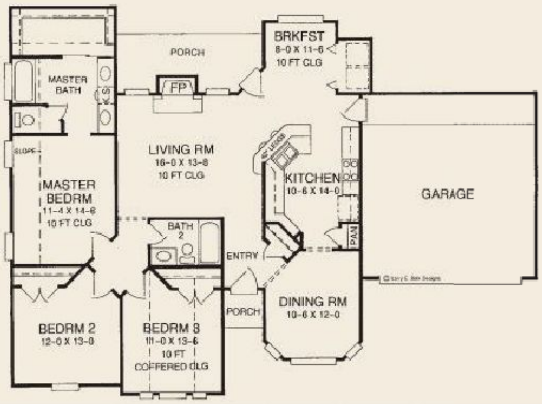
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PLAN # HWB9700010 ■ **5-SET** N/A ■
8-SET N/A ■ **REPRO** $2,071 ■ **CAD** N/A

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Square Footage: 1,500 ■ **Bedrooms:** 3 ■ **Bathrooms:** 2 ■ **Dimensions:** 59' - 10" X 44' - 4" ■ **Foundation:** Crawlspace, Slab





PLAN # HWB9700011 ■ **5-SET** $630 ■ **8-SET** $690 ■ **REPRO** $870 ■ **CAD** N/A



PLAN # HWB9700012 ■ **5-SET** $1,105 ■ **8-SET** $1,195 ■ **REPRO** $1,515 ■ **CAD** N/A

First Floor: 2,608 sq. ft. ■ **Second Floor:** 1,432 sq. ft. ■ **Total:** 4,040 sq. ft. ■ **Bedrooms:** 4 ■ **Bathrooms:** 3 1/2 ■ **Dimensions:** 89' - 10" X 63' - 8" ■ **Foundation:** Crawlspace, Slab



FIRST

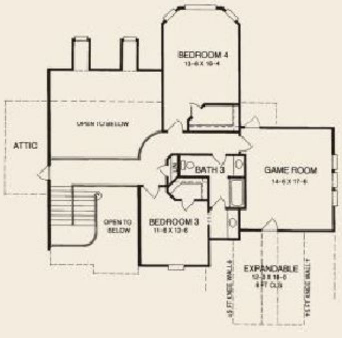


SECOND

First Floor: 2,654 sq. ft. ■ **Second Floor:** 1,013 sq. ft. ■ **Total:** 3,667 sq. ft. ■ **Bedrooms:** 4 ■ **Bathrooms:** 3 1/2 ■ **Dimensions:** 75' - 4" X 74' - 2" ■ **Foundation:** Crawlspace, Slab, Unfinished Basement



FIRST



SECOND

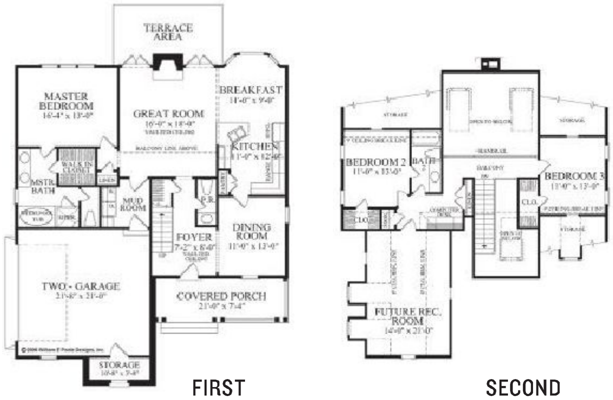


PLAN # HWB9700013 ■ **5-SET** $1,105 ■ **8-SET** $1,195 ■ **REPRO** $1,515 ■ **CAD** N/A

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First Floor: 1,424 sq. ft. ■ **Second Floor:** 596 sq. ft. ■ **Total:** 2,020 sq. ft. ■ **Bonus Space:** 338 sq. ft. ■ **Bedrooms:** 3 ■ **Bathrooms:** 2 1/2 ■ **Dimensions:** 45' - 0" X 55' - 2" ■ **Foundation:** Crawlspace, Unfinished Basement



FIRST SECOND

PLAN # HWB9700014 ■ **5-SET** $800 ■ **8-SET** $875 ■ **REPRO** $1,100 ■ **CAD** N/A

Square Footage: 2,441 sq. ft. ■ **Bonus Space:** 606 sq. ft. ■ **Bedrooms:** 3 ■ **Bathrooms:** 2 1/2 ■ **Dimensions:** 74' - 0" X 51' - 0" ■ **Foundation:** Crawlspace, Unfinished Basement





PLAN # HWB9700015 ■ **5-SET** $800 ■ **8-SET** $875 ■ **REPRO** $1,100 ■ **CAD** N/A



First Floor: 1,981 sq. ft. ■ **Second Floor:** 291 sq. ft. ■ **Total:** 2,272 sq. ft. ■ **Bonus Space:** 412 sq. ft. ■ **Bedrooms:** 4 ■ **Bathrooms:** 3 1/2 ■ **Dimensions:** 58' - 0" X 53' - 0" ■ **Foundation:** Crawlspace



FIRST SECOND

PLAN # HWB9700016 ■ **5-SET** $800 ■ **8-SET** $875 ■ **REPRO** $1,100 ■ **CAD** N/A

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Square Footage: 2,639 ■ **Bonus Space:** 396 sq. ft. ■
Bedrooms: 3 ■ **Bathrooms:** 2 1/2 ■ **Dimensions:** 73' - 8" X 58' - 6" ■
Foundation: Crawlspace





PLAN # **HWB9700017** ■ **5-SET** $800 ■
8-SET $875 ■ **REPRO** $1,100 ■ **CAD** N/A



Square Footage: 4,222 ■ **Bonus Space:** 590 sq. ft. ■ **Bedrooms:** 4 ■
Bathrooms: 5 ■ **Dimensions:** 83' - 10" X 112' - 0" ■ **Foundation:** Slab





PLAN # **HWB9700018** ■ **5-SET** N/A ■
8-SET N/A ■ **REPRO** $1,688 ■ **CAD** N/A

First Floor: 2,854 sq. ft. ■ **Second Floor:** 484 sq. ft. ■ **Total:** 3,338 sq. ft. ■
Bedrooms: 4 ■ **Bathrooms:** 3 1/2 ■ **Dimensions:** 77' - 4" X 94' - 0" ■
Foundation: Slab



FIRST



SECOND



PLAN # **HWB9700019** ■ **5-SET** $795 ■
8-SET $855 ■ **REPRO** $1,065 ■ **CAD** $1,585

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PLAN # HWB9700020 ■ 5-SET $900 ■ 8-SET $1,000 ■ REPRO $1,250 ■ CAD N/A

First Floor: 1,840 sq. ft. ■ **Second Floor:** 950 sq. ft. ■ **Total:** 2,790 sq. ft. ■ **Bedrooms:** 4 ■ **Bathrooms:** 3 ■ **Dimensions:** 58' - 6" X 62' - 0" ■ **Foundation:** Finished Walkout Basement



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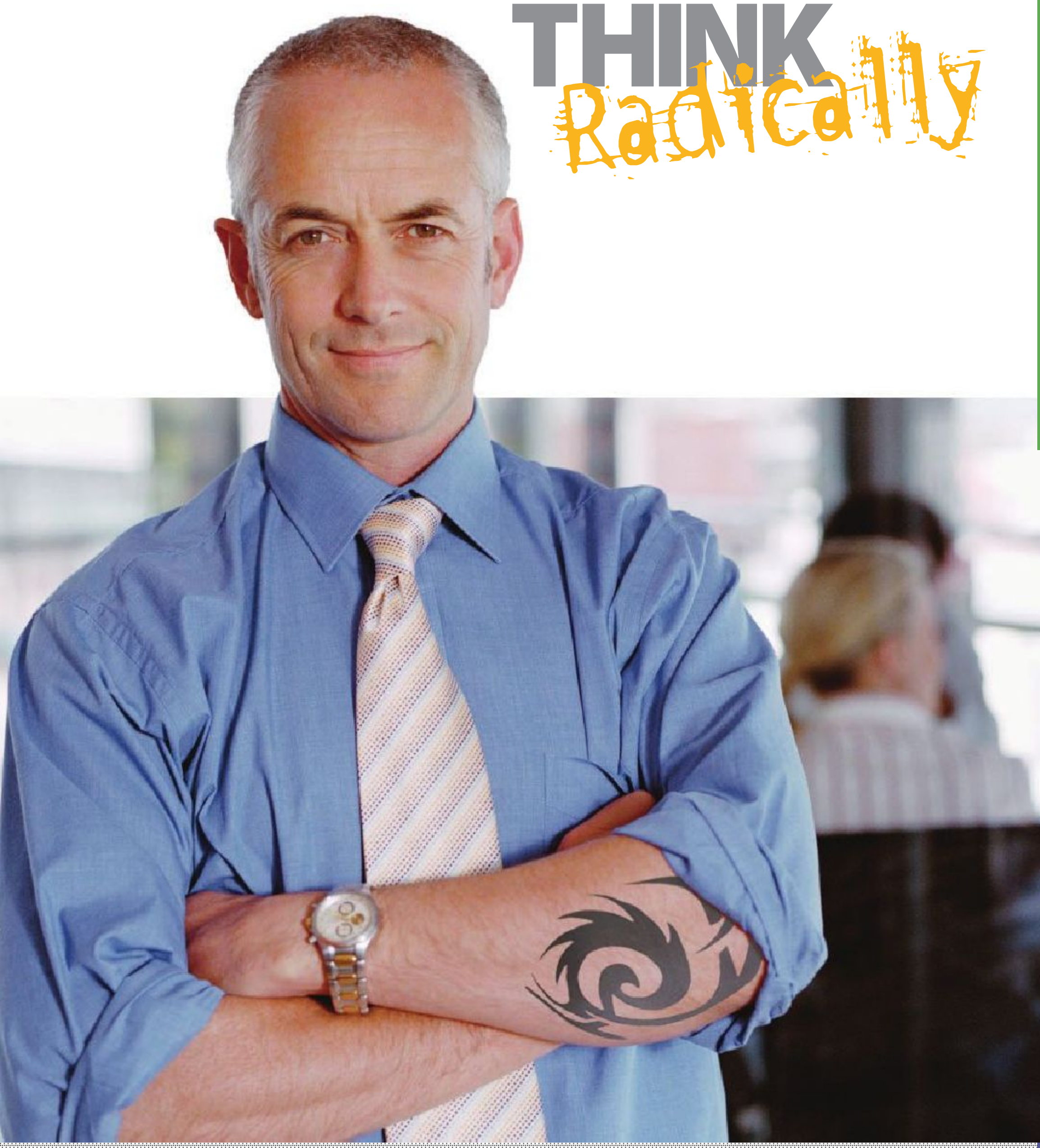
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Outwater: Circle 230



New Concept Louvers: Circle 231



Met-Tile: Circle 232



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Speaking of adding interest to your roof, not to mention superior performance, consider the fact that the metal tile panel roofing system from **Met-Tile** combines the popular look of tile with ENERGY STAR® "cool roof" performance and outstanding weather resistance. Easy-to-install 26 GA panels weigh just 125 pounds per square and can be applied over existing shingles, solid decking, or open purlins. Panels are three feet wide and come in lengths of two to 20 feet. This system resists hurricane winds (230+ mph rating), fires, earthquakes, hail, pest infestation, and rot, and comes in 10 energy-efficient designer colors with matching accessories and trim.

Shutters As a Work of Art

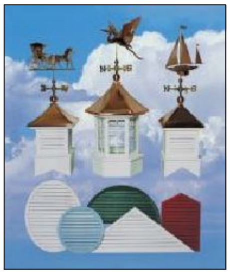
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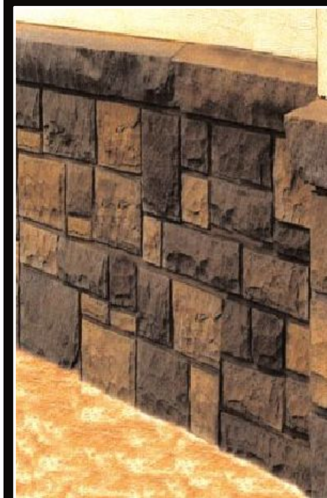
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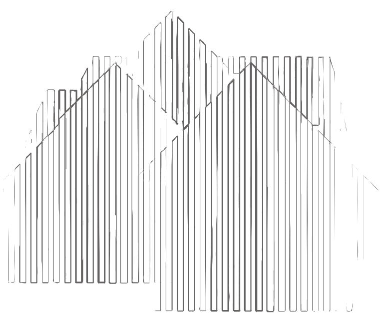
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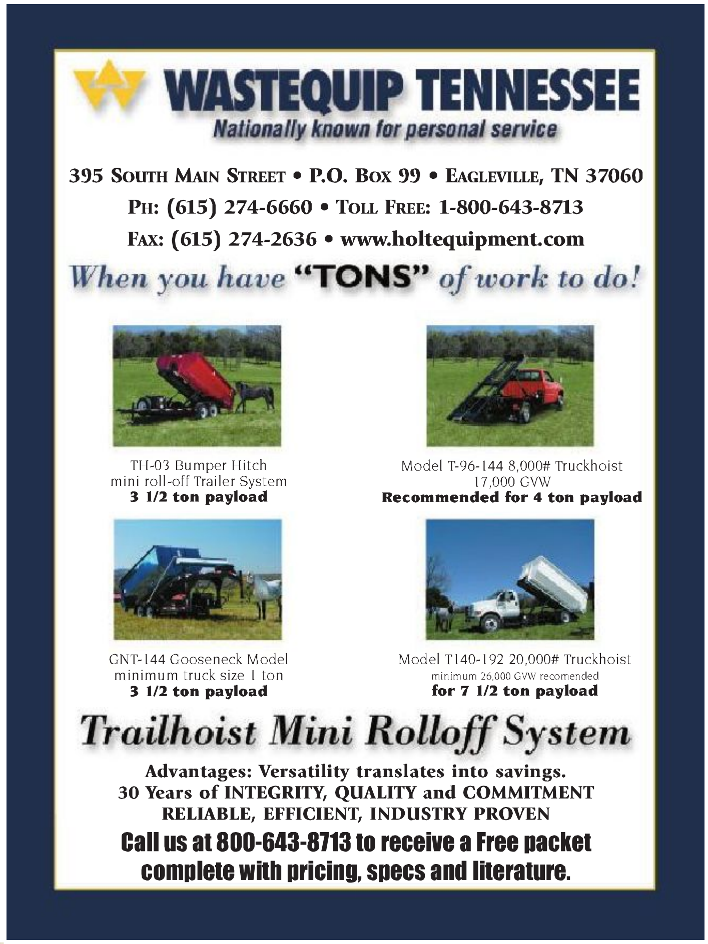
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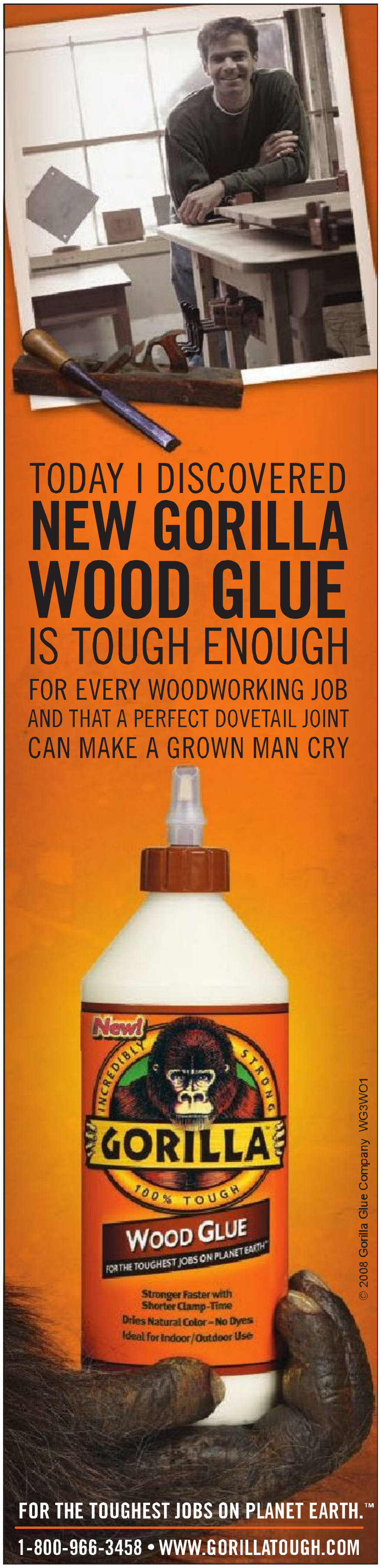
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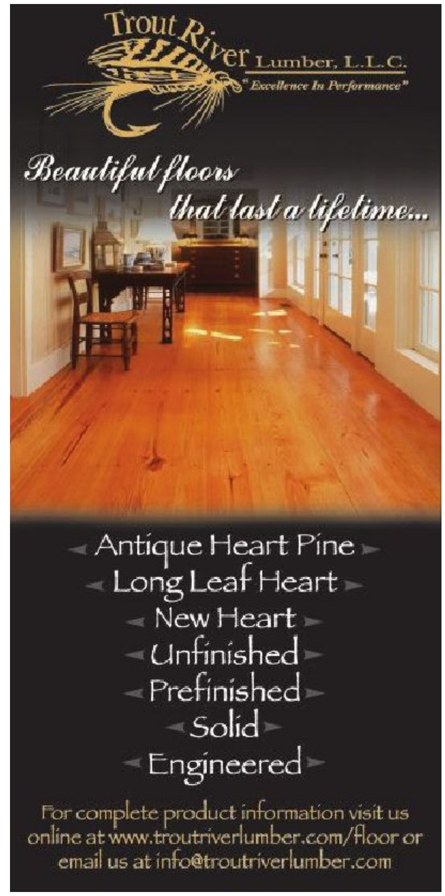
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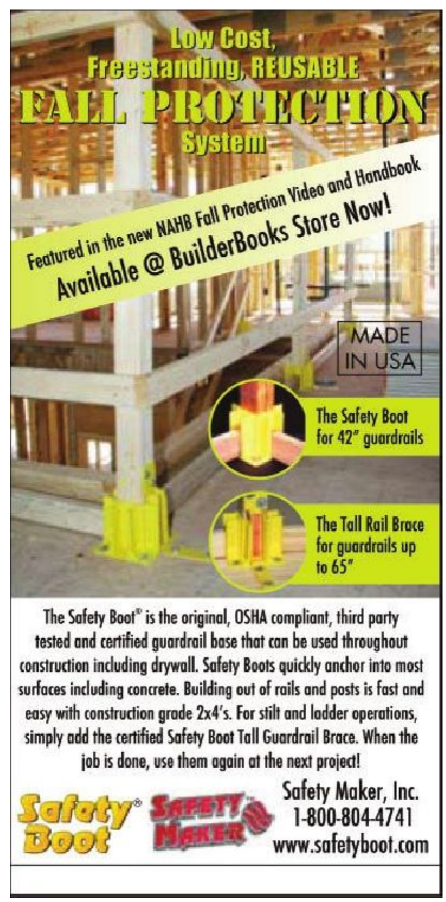
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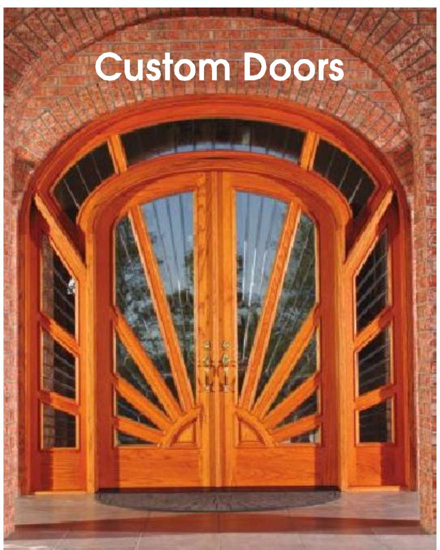
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AT&T Mobility	53	613	866-372-2806
AZEK Deck	54	268	877-ASK-AZEK
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Calculated Industries	30	–	800-854-8075
Carrier Corp.	**65**	**289**	**866-402-6945**
CertainTeed FiberCement	**13 FLIP**	**602**	**800-233-8990**
Cosella Dorken	24	313	888-4DELTA4
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pig." Its own polling told Shea Homes in 2006 that the ripest targets for green homes are downsizing active adults with cash, says Rich Andreen, president of Shea's Active Lifestyle Communities division, which last fall started building to a mixture of green guidelines.

"Consumers are interested in green but don't know the right questions to ask," says UCLA's Corbett. So Green Built North Texas has launched a registry of homes that measure up to its guidelines. KB Home is placing into its design studios "education centers" that provide tips on energy efficiency, water conservation, healthy homes, and sustainable sources. "The goal is to change buyers' behavior," says Lisa Kalmbach, the builder's senior vice president.

The evidence of cost savings is mounting: The city of Riverside, Calif., estimates that a solar-powered, 2,800-square-foot house could realize net savings, after tax credits and utility rebates, of $10,000 after just a few years. Certified green homes in Seattle sold quicker than non-green units and for an 11 percent premium, reported a recent *Wall Street Journal* story. The public's awareness of this information should lead to a "flight to quality," predicts Greg Kats of consulting firm Capital E.

That's already happened at Terramor Village at Ladera Ranch in California, the country's largest solar community, where Judi Schweitzer, a green real estate consultant specializing in market-based creative solutions, did her post-graduate work. She found that solar homes sold at a 2.3 percent premium over non-solar, resold at a 4.1 percent premium, and outsold non-solar homes by 2½ to 1 or more. She believes such absorption rates alone will push builders toward sustainability.



A GREENER FUTURE: Kentucky Gov. Steve Beshear blows foam insulation into the wall of a house to celebrate the launch of his state's green program.

CARROT AND STICK

Anyone pondering where green building is headed should surf bcap-energy.com, a Web site that tracks energy statutes. The site confirms what builders already know: States are burnishing their environmental credentials by passing legislation that will dictate how the built environment is shaped. McStain's Wittenberg says solar popped onto Colorado builders' radar last year after lawmakers required energy providers to generate 15 percent of their output from renewable sources by 2012.

But builders break out the aspirin at the prospect of every town in America enforcing its own green mandates to mollify voters' anxieties. Mandates are self-defeating, insist builders and some green experts, if they impede new innovations from gaining acceptance. Richard Morgan, who manages Austin [Texas] Energy's Green Building Program, thinks "green mandate" is an oxymoron anyway, because "that's when it stops being green building, which is about the exploration of the possible and the industry's future."

Yet, he's comfortable with Austin Energy's energy codes because of its "collaborative relationship with builders." Industry-government cooperation, in fact, is no longer rare. Laurence Kornfield, San Francisco's chief building inspector, recalls little friction in the 18 months it took to craft a bill that would make that city's building codes among the country's greenest. "The builders on the task force were doing most of this anyway."

By Oct. 1, 2011, all construction in Dallas must be certifiable under LEED or Green Built North Texas standards, although third-party certification won't be required, says Zaida Basora, assistant director of public works. (At first, Green Built North Texas' program had 38 mandated elements. But after 18 months, it added more elective, "to get more builders to think green," explains Fette.)

Dallas doesn't offer compliance incentives, although green building has been made more lucrative elsewhere. Enterprise Green Communities, which has donated $570 million to build 11,000 affordable green homes, offers developers $1,000 per unit if they take an integrated design approach, says Trisha Miller, the program's deputy director. In Cincinnati, structures that meet LEED standards receive tax abatements for 15 years, up to $500,000. If the house is built or remodeled to LEED Platinum, "the cap comes off," says Mike Holcomb, a local home energy rater.

New Mexico cushions its green mandates with "attractive incentives," says Brad Hill, executive director of the New Mexico Foundation for Building, a verifier for the state's Sustainable Building tax credit, which ranges from $9,000 to $22,450 depending on the house's size and which standard it's certified to. Hall and David Mann, the Foundation's housing program director, think the "next frontier" could be incentives for greener land use.

Where legislative mandates go after that is anyone's guess, but they seem likely to become ubiquitous.—*J.C.*

Overall Cost of LEED Home

Comparison Criteria	Code Home	LEED Home	Difference ($/Month)	($/Day)
Sticker Price	$300,000	$308,500		
Mortgage Payment	$1,890	$1,945	+ $55	+ $1.80
Energy Bill	$150	$105	- $45	- $1.50
Water Bill	$30	$20	- $10	- $0.30
Net Cost of Ownership	$2,070	$2,070	- $0	- $0

SOURCE: FOUNDATION FOR BUILDING

IT'S A WASH: New Mexico's Foundation for Building, with this comparison, demonstrates that once utility bills are considered, green-built homes are no more expensive than non-green units.

UPlink // TO LEARN MORE ABOUT THE COMPANIES MENTIONED IN THIS STORY, GO TO WWW.BUILDERONLINE.COM/SUSTAINABLE2008.

around 225 builders follow the guidelines of HBA of Metro Denver's Built Green Colorado. Last year, those builders started 12 percent of the state's new homes, estimates Kim Calomino, the program's director.

"The housing industry needs [green building] for its own sustainability," says Matt Belcher, whose Belcher Homes in St. Louis is managing a development called Rock Hill Trails where it's building energy-efficient and conservation features—including geothermal systems and rainwater recapture cisterns—into its homes. McStain Communities in Louisville, Colo., is among nine builders participating in a water efficiency evaluation of appliances and fixtures with the EPA and Denver Water Board. McStain's CEO, Eric Wittenberg, refers to himself as a "sustainability evangelist."

McStain's Bradburn Village in Westminster, Colo., offers solar panels as standard, another sign that solar is the sizzle in green marketing. Woodside Homes is installing solar systems in 1,487 homes in Sacramento, Calif., partly financed by that city's Municipal Utility District. Scott Hoisinger, Woodside's regional president in Northern California, says his company "is looking at other ways to make our houses greener" with radiant-barrier sheathing, energy-efficient windows and appliances, and by working with trade partners to reduce jobsite waste.

The U.S. Department of Energy recently approved an energy-efficient community that Pulte Homes will develop with GE, Nevada Power, and the University of Nevada–Las Vegas. But the builder is also making its homes there more efficient in basic ways, such as equipping them with tankless water heaters, says Walter Cuculic, the division's director of strategic marketing. As builders move toward green, they can't ignore cost while home prices are dropping. Woodside, for one, is absorbing about $10,000 of the cost of eco products it's adding.

But builders must also better promote the benefits of green and sustainable homes, especially to appraisers and realtors, who often don't even allow check-off boxes for Energy Star–rated homes. Green Built North Texas' pilot program produced 14 homes that could be heated or cooled for $50 per month, versus $150 for conventional houses. "That's $36,000 savings over 30 years at today's energy costs," says Dan Fette, a builder and the program's chairman. Green Built had to conduct classes for appraisers before they'd recognize the value of those houses.

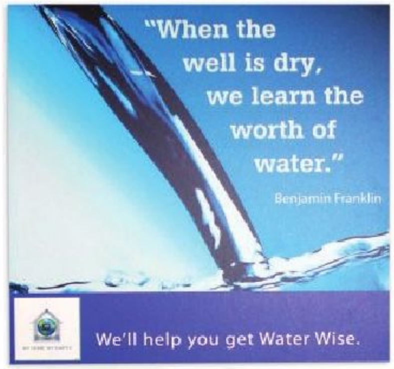
CONSUMER INTEREST GROWS

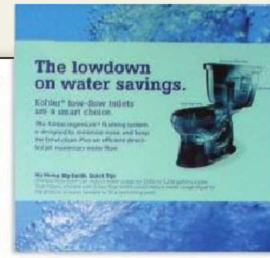
Consumers have had their consciousness raised about the relationship between consumption and how they live by the shocks of oil trading above $130 a barrel, gas selling for $4.50 a gallon, and water shortages in the South and West. But is that awareness creating a body of home buyers for whom efficiency tops their preferences?

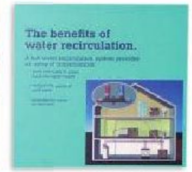
Not yet, says Fette, who gleaned from the NAHB's recent Green Building conference in New Orleans that green builders might be ahead of the demand curve. But green isn't just "eco bling for celebrities" either, says Michelle Moore, senior vice president with the U.S. Green Building Council; it's gone mainstream, thanks to alarms being sounded about global warming.

Calomino worries that consumers jaded by bogus greenwashing claims "might start thinking it's all B.S." But others think buyers will gravitate toward green homes because "the economy can no longer grow if we rely on our energy from fossil fuels," predicts Nat Kreamer, president of Sun Run Generation, which offers solar panels to owners of existing homes through a leasing agreement that reduces the system's upfront cost, provides free maintenance for 18 years, and guarantees a 13.5 cent per kilowatt hour charge over the life of the contract.

Value is essential to buyers: Pulte and UCLA's Anderson School surveyed 500 prospects, and what they found, says Cuculic, is "if you don't have the product and location, green can be like putting lipstick on a (see page 16)











BEHAVIOR SHIFT: KB Home has installed kiosks in its 20 design studios to advise homeowners on how they can conserve energy and water and to encourage them to take action.

ARE YOU OR HAVE YOU BEEN INVOLVED IN ANY GREEN BUILDING PROJECTS? YES

	YES
Single-Family Builder	56%
Custom Home Builder	63%
Multifamily	64%
Remodeler	52%
Subcontractor	46%
Residential Architect	72%
Other	62%
All	58%

SOURCE: HANLEY WOOD MARKET INTELLIGENCE

STANDARD OPERATING PROCEDURE: A growing number of municipalities now require greener protocols for residential and commercial construction.


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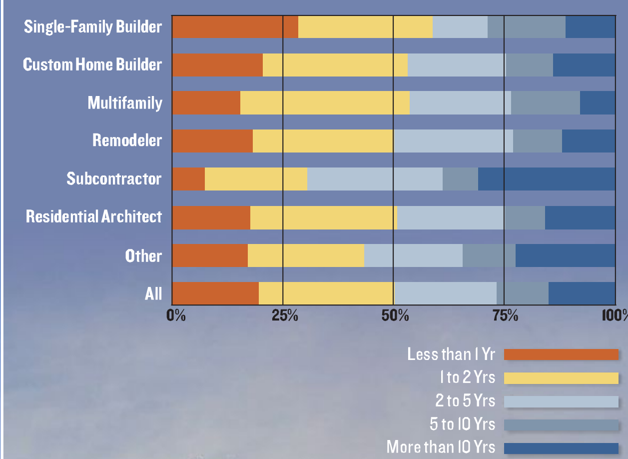
FURTHER CONSIDERATIONS

A Practical Option

Forget environmental stewardship for a minute. Greener, sustainable construction is in builders' best interests on economic grounds.



HOW LONG HAVE YOU BEEN INVOLVED IN GREEN BUILDING OR DESIGN?



SOURCE: HANLEY WOOD MARKET INTELLIGENCE

PINN BROTHERS FINE Homes has two projects underway that include San Jose, Calif.'s first LEED-certified homes with solar panels. All of the builder's five current projects, with 273 units in various stages, will meet LEED specifications. Project manager John Moniz says Pinn's green building is voluntary. But he also thinks it's only a matter of time before cities impose green construction mandates. "It's something builders will have to deal with."

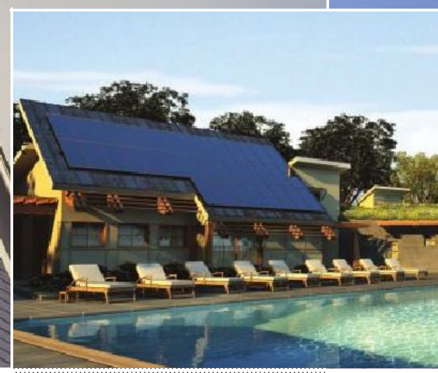
The threat of mandates and stricter codes, though, isn't the only reason builders are considering greener or sustainable alternatives to what they're building now. Even those who reject the proposition that the housing industry bears at least some responsibility for profligate consumption and decimation of natural resources can't ignore how market forces are driving competitors and customers toward homes that promise a smaller carbon footprint and lower energy and water bills. One estimate projects a fivefold increase, to $60 billion, over the next two years in the value of homes built to green standards nationwide.

"There's lots of evidence that eco-friendly homes are better built, are easier to sell, resell, or rent, and sell for more," observes Charles Corbett, professor of operational and environmental management at UCLA's Anderson School of Management. "When those economic benefits come into play, whether a builder is saving the planet is almost irrelevant."

COMPETITIVE PRESSURE

KB Home has composed its first "sustainability report," which will serve as its blueprint to become a leading green builder. "We're not green yet, not even close," admits Jeff Mezger, CEO for the Los Angeles–based builder, which ranked first among 13 public builders in a recent survey of their green building practices. "But we're headed there."

Kevin Morrow, manager of the NAHB's Green Building program, thinks the housing industry is at "a tipping point." Through April, more than 1,500 builders had signed up to use the green scoring tool on the program's Web site. In Colorado, *(see page 14)*



WALKING THE TALK: More builders are identifying themselves as green. McStain Communities, for example, offers solar panels as standard in one village and a zero-energy community center (above) in another.

DO YOU CONSIDER YOURSELF A "GREEN" BUILDER?

	YES
Single-Family Builder	39%
Custom Home Builder	50%
Multifamily	51%
Remodeler	40%
Subcontractor	55%
Residential Architect	49%
Other	61%
All	47%

SOURCE: HANLEY WOOD MARKET INTELLIGENCE



THE DRAWBACKS OF REPETITION:

Production homes are more harmful to the environment when ...

- House after house is built with single-pane windows, which lose twice the energy of a house with double-pane windows.
- House after house is poorly insulated, which an estimated four-fifths of homes built since 1980 have been.
- House after house, the roof design doesn't include deeper overhangs for shade and protection.
- House after house is laid out in neighborhoods whose streets don't run east-west, and the houses don't get maximum exposure to the sun.
- House after house doesn't have drip irrigation, as one-third of a home's water use goes toward irrigation, 50 percent of which is lost to over-watering or evaporation.
- House after house isn't built as a system where the tightness of the envelope, the insulation used, the size of the windows, and room locations are factored into the capacity of the water heater, furnace, and air-conditioning system.

SOURCES: EPA; ENERGY STAR; NATIONAL GEOGRAPHIC; U.S. GREEN BUILDING COUNCIL







IF...?

mean less power would be needed to pump water into homes.

- If all consumers of air conditioners this year purchased energy-efficient models, **831 million kilowatt-hours would be saved and 1.3 billion pounds of greenhouse gas emissions prevented,** equal to taking 116,000 cars off the road for a year.
- 6 billion kilowatt-hours per year would be saved if every home replaced an incandescent light bulb with **one compact fluorescent bulb.**



PHOTOS: ISTOCK





READY AND WAITING

Between 5% and 15% of the energy used for electricity by households goes toward standby power.

	2007 (4.75Q BTUs)	2030 (5.88Q BTUs)
Air conditioners	16.5%	17.7%
Lighting	15.5%	8.3%
Domestic appliances	10.3%	9.7%
Refrigeration/Freezers	9.8%	8.6%
Water heating	8.0%	7.3%
Television	7.4%	9.4%
Heating	6.3%	6.5%
Personal computers	1.5%	2.7%
Other electronics	24.7%	30.7%

SOURCE: ENERGY INFORMATION ADMINISTRATION

PUSHING THE BOUNDARIES

Market	Demand to exceed projected land supply by:
DuPage County, Ill.	453.7%
Cobb County, Ga.	349.9%
Marion County, Ind.	292.8%
Broward County, Fla.	225.5%
Mecklenberg County, N.C.	205.4%
Gwinett County, Ga.	164.3%
Fairfax County, Va.	162.8%
Clayton County, Ga.	161.8%
Lake County, Ill.	160.9%
DeKalb County, Ga.	157.2%
Tarrant County, Texas	135.8%
Dallas County, Texas	130.9%
Franklin County, Ohio	110.6%
Oklahoma County, Okla.	109.2 %
Harris County, Texas	105.1%
Hennepin County, Minn.	104.9%

10 POUNDS IN A 5-POUND SACK: The recent housing downturn might have prevented, if only temporarily, a collision between land supply and development demand in fast-growth counties projected to use the highest percentage of their remaining open space through 2025.

SOURCES: NATURAL WILDLIFE FEDERATION; NATURE SERVE

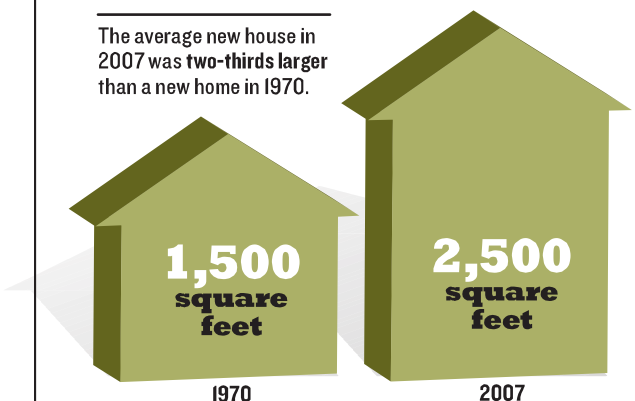
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Still a Hard Sell

SOME 70 MILLION HOMES MIGHT NEED TO BE built by 2030 to meet the demands of a burgeoning U.S. population. More builders are seeing the light about the need for constructing tighter, more efficient houses. And numerous Web sites offer constructive tips on how consumers can reduce their environmental footprint. But green building has been slower to capture the public's attention, in part because of skepticism raised by opponents' alarmist scenarios. For example, an editorial on April 28 in *The Wall Street Journal* by Stephen F. Hayward of the American Enterprise Institute claimed that an 80 percent reduction of 1990-level CO2 emissions by 2050—which environmentalists insist is essential to reversing global warming's impact—would allow a typical home to draw only enough electricity "to run the average hot water heater."—*J.C.*



The average new house in 2007 was **two-thirds larger** than a new home in 1970.



SOURCES: NAHB; AUSTIN ENERGY

❯ In Austin, Texas, a 6,000-square-foot house will draw **40 percent more electricity** during a peak load period on a hot summer day than a 2,300-square-foot house.

BIGGER HOUSES AND MORE CARS: A DOUBLE WHAMMY FOR THE ENVIRONMENT



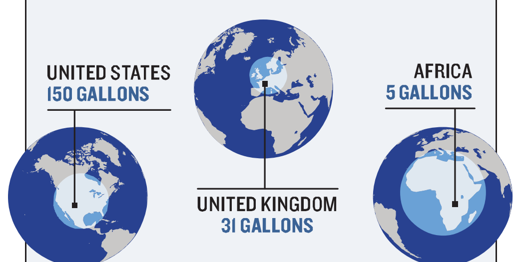
❯ Nearly one-third of all U.S. households have **three cars or more.**

❯ Over the past decade, there's been an **80 percent increase in road travel** by Americans.

SOURCES: THE NEW STATESMAN; SMART GROWTH FOR AMERICA

21% OF CO_2 EMISSIONS ARE GENERATED BY HOUSES

WATER CONSUMPTION PER PERSON PER DAY



IN THE U.S.:

❯ Households use one-third of the water they consume outdoors. Drip irrigation uses **20 percent to 50 percent less water** than conventional sprinklers.

❯ The energy required to distribute and treat water is the country's greatest consumer of electricity, equal to powering **5 million households** per day.

SOURCES: EPA; U.S. GEOLOGICAL SURVEY; ALTERNET.ORG

1 in 17 homes built from 2000 through 2007 were Energy Star–rated.

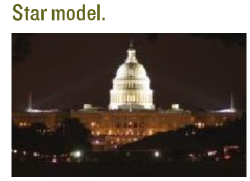
2% of all new homes constructed through 2006 were built to any green standards or guidelines.

SOURCES: EPA; MCGRAW-HILL CONSTRUCTION; DEPARTMENT OF ENERGY

WHAT

❯ **120 billion gallons of water** per year would be saved if 1 in 10 households installed Water Sense bath fixtures.

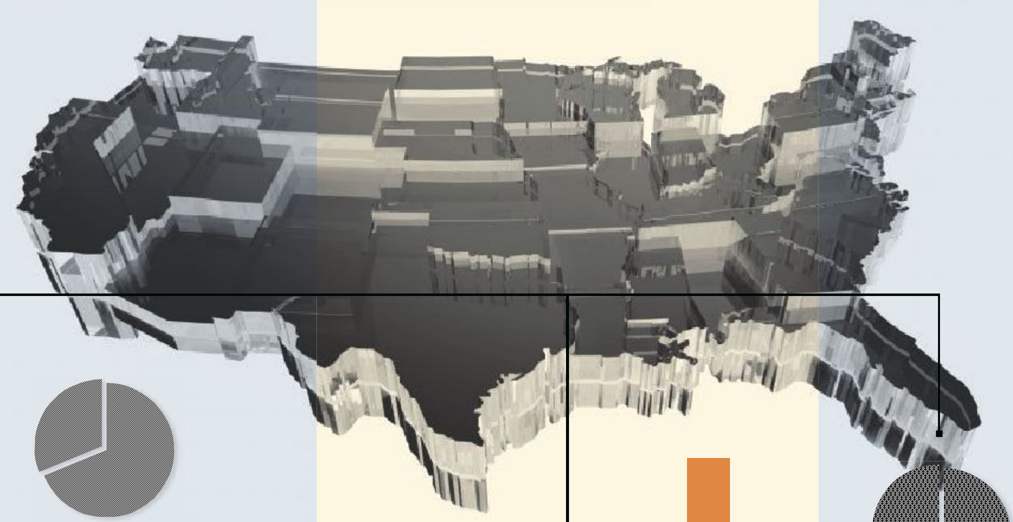
❯ 1.1 billion kilowatt-hours of electricity, 60 million BTUs of natural gas, and 69 million gallons of water—equal to **powering Washington, D.C.**, for eight months and filling the Rose Bowl with water 818 times—would be saved each year if everyone who purchases a washer this year chose an Energy Star model.

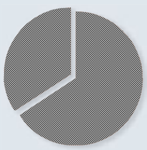


❯ The equivalent of half of all **power generated by nuclear power plants** in the U.S. is used each year for refrigerators and freezers.

❯ 100 million kilowatt-hours of electricity per year would be saved if **1 in 100 homes installed low-flow faucets**; less water would

UNITED STATES:
CAN IT CONTINUE TO EXPAND AND FIND SUFFICIENT WATER AND CLEAN ENERGY?





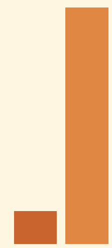
The U.S. currently imports about **two-thirds of the oil** it consumes.

The U.S. uses **69 percent** of its oil for transportation.

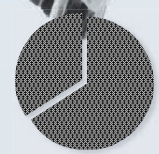
- If residential development doesn't slow, vehicle miles traveled will cancel the benefits of the recently passed energy bill.
- 2.9 billion gallons of fuel per year are wasted by vehicles sitting in traffic.
- Transportation energy use is 120 percent of the energy used for the built environment.



ENERGY USE
(per household per year)
+ **6 quadrillion** BTUs (17.6% of total)
+ **21 quadrillion** BTUs (21.2% of total)



ELECTRICITY USED
(per household per year)
+ **1,584** kilowatt hours
+ **11,840** kilowatt hours



By 2025, **two-thirds of the water used** nationally in the U.S. will go toward irrigation, versus **40 percent** today.

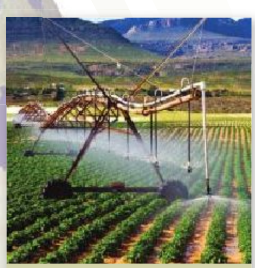
- By 2018, **36 states** are expected to be perennially strapped for water.







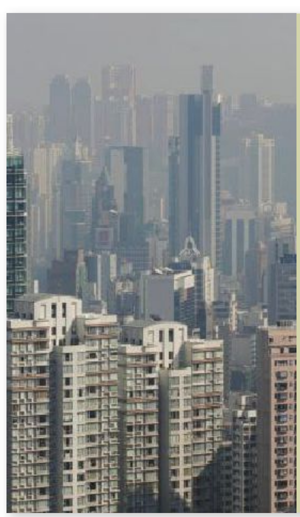
SOURCES: EPA; SMART GROWTH AMERICA; NATIONAL GEOGRAPHIC; ENERGY INFORMATION ADMINISTRATION; U.S. DEPARTMENT OF ENERGY



- **70 percent** of the world's **water consumption** per day goes toward agriculture.
- By 2025, **2.8 billion people** in 48 countries will live in areas facing **water stress** or scarcity.



- The world's **forest** area gets reduced, on average, by **60,000 kilometers per year.**
- **Deforestation** accounts for **one-fifth** of annual CO_2 emissions.



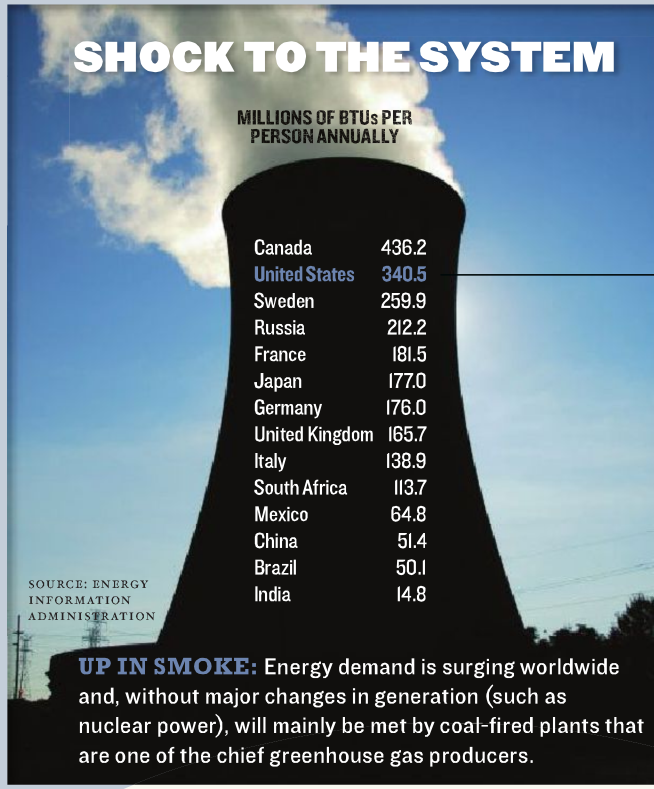
- The world's **energy consumption will rise** by 57 percent, between 2004 and 2030, to **702 quadrillion BTUs**. China alone will account for one-third of the developing countries' increase in energy demands.
- Global **electricity usage will rise** by 36.2 percent to **30,364 billion kilowatt hours** in 2030.
- **CO_2 emissions** in developing countries **will increase at a rate three times** that of developed countries.
- By 2031, **car ownership** in China is projected **to triple** to three for every 100 people.
- If China's per-capita **energy consumption rate**, now 11 times below the U.S., catches up to the U.S., its oil consumption would increase by **106 percent.**

SOURCES: RAINFOREST ACTION NETWORK; WORLD BANK; *THE NEW YORK TIMES*; UNITED NATIONS; ENERGY INFORMATION ADMINISTRATION; U.S. DEPARTMENT OF ENERGY; ENERGY STAR; JARED DIAMOND (*LOS ANGELES TIMES*)

One World, One Problem

When it comes to the environment, the world's problems are America's and vice versa. On some days, one-quarter of Los Angeles' air pollution is attributable to China's coal-fired plants. Ecologist Stephen Pacala warns that if the growth rate of global CO_2 emissions over the past 30 years isn't abated over the next 50, the atmospheric concentration of that gas would more than double by mid-century. That could cause the world's temperature to rise 5 degrees F over the next century, "altering all ecosystems and causing massive population displacement," predicts National Geographic. The U.S. has contributed to this as it has developed land, since 1980, at three times the pace of its population growth. Today, U.S. buildings consume two-fifths of the country's energy and emit about the same portion of its CO_2. Energy consumed by homes tripled from 1950 to 2006.—*J.C.*

SHOCK TO THE SYSTEM



MILLIONS OF BTUs PER PERSON ANNUALLY

Canada	436.2
United States	340.5
Sweden	259.9
Russia	212.2
France	181.5
Japan	177.0
Germany	176.0
United Kingdom	165.7
Italy	138.9
South Africa	113.7
Mexico	64.8
China	51.4
Brazil	50.1
India	14.8

SOURCE: ENERGY INFORMATION ADMINISTRATION

UP IN SMOKE: Energy demand is surging worldwide and, without major changes in generation (such as nuclear power), will mainly be met by coal-fired plants that are one of the chief greenhouse gas producers.

PHOTOS: ISTOCK

Developing and developed nations are now vying as never before for limited natural resources.



- The **world's population** is projected to rise to **9 billion by 2050**, from 6.52 billion now.
- Currently, there are more than **400 cities with 1 million or more people.** Three-fifths of the world's population will live in cities by 2030, compared to more than half now.
- Cities produce **80 percent of the world's carbon dioxide** emissions now.
- **Two-thirds** of the growth in **energy demand** through 2020 will come from **developing nations.**

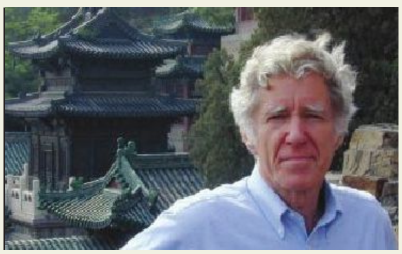


GLOBAL DISTRESS: CAN A DEPLETED ENVIRONMENT WITHSTAND THE NEXT ROUND OF GROWTH?

Bleak Assessments

Economic and environmental experts see problems and solutions in terms of changing personal behaviors.

Lester Brown
President, Earth Policy Institute
"Americans have been behaving like Enron at the height of its folly ... because we're hiding some of the costs [of energy consumption] off the books. If we don't put a price on CO_2 we're building up, or on our addiction to oil, we'll never nurture the innovation we need."



Jeff Kingsbury
Managing Principal, Greenstreet, Ltd.
"The research shows that all else being equal, sure, the American public is concerned about the environment. They'll do what they can, but the underlying assumption is they won't sacrifice quality or pay more [to help the environment]."

Arjun N. Murti
Energy Analyst, Goldman Sachs
"The possibility of $150 to $200 per barrel [of oil] seems increasingly likely over the next six to 24 months, though predicting the ultimate peak in oil prices as well as the remaining duration of the up cycle remains a major uncertainty."

"We're literally stuck up a cul-de-sac in a cement SUV without a fill-up."
—James Howard Kunstler, Author

Witold Rybczynski
Architect and Author
"For the moment, it doesn't look as if the majority of Americans, who live in the suburbs, are going to move back to cities, so smart growth and new urbanism are certainly one answer to sprawl. The biggest impediment is probably the resistance of communities, for [which] 'density' has become a dirty word. It is also true that higher-density residential developments, with more emphasis on design and a more complicated sort of marketing, are slightly more expensive and slightly more risky. This has discouraged some developers from trying. The smart-growth model is inherently more complicated, so it isn't suitable for beginners or inexperienced developers."



Shyam Kannan
Vice President and Director of Research and Development, Robert Charles Lesser & Co.
"If you look at long-term energy prices and affordability, this is not the first time we've experienced [increased prices]. Every single time we've bumped into something, we've found ways to continue to consume more energy. Historically, it hasn't had huge impacts on people's real estate choices. I will still venture a guess that the average duration of a shower in the Atlanta area hasn't dropped below five minutes. I love energy savings; that's fine. But it's a very difficult proposition—spend money here, save money there. One thing that is a more optimistic conversation that hasn't had enough discussion is rather than dwelling on notions that green building has to cost more, is that the people who are making it work have found out how to build cheaper. When you put in [water-blown foam insulation], for example, you could go from [needing] a 3-ton HVAC to a 2-ton HVAC. Holy moly."



BOTTOM PHOTO: AP

"We do face a planetary emergency. The phrase sounds shrill to many, but it is unfortunately quite accurate. Humankind must now find a way to reach a higher level of consciousness that allows us to see our planet whole."
—Former Vice President Al Gore



GETTY

BY JOHN CAULFIELD

Road to Perdition?

For too long, builders have been oblivious to the destructive impact on the environment caused by development and construction.

REMEMBER WHEN RONALD Reagan mused, in 1981, that "trees cause more pollution than automobiles do"? A sizable number of home builders seem to have taken that statement to heart over the following two decades. The way many of them plowed through farmlands, forestlands, wetlands, and whatever open space was available for development often showed a serious disregard for the environmental ramifications of growth.

Many builders still view environmental protection the way Vice President Dick Cheney does, as "a personal virtue," or in other words, as someone else's problem. Their home designs give short shrift to energy and water conservation, as size trumps efficiency and cost controls trump everything else. Builders and buyers who flocked to suburban subdivisions in search of larger, cheaper lots and homes conveniently blotted out how longer commutes to job centers would create more traffic congestion and pollution. Smart growth, with its ideals for denser, walkable communities that at least nod at sustainability, was something builders resisted because for them it translated into less profit. To be sure, home buyers weren't exactly clamoring for eco-friendly options or locations, either.

This special report looks at how residential construction has contributed to the world as it stands today: with depleted natural resources, soaring energy prices, and a diminished natural environment. A still-small but increasing number of builders now realize that old methods of design, development, and construction must be altered, and fast, to minimize environmental damage as the industry strives to meet the housing needs of 100 million more people by 2030 in the U.S. alone.

How many builders see the future this way remains to be seen, since even respected scientists and economists wonder if climate change will be the calamity environmentalists expect. Still, a paradigm shift among builders toward greener and sustainable houses seems in order as more consumers ask for green homes and more states enforce green building statutes. From a purely economic standpoint, "the real risk," says Greg Kats of Capital E, which invests in eco-friendly construction, "is not going green."—*J.C.*



More Than Enough

Sustainable development may be in vogue today, but over-consumption has driven the market for the last two decades.

WE ENTER A MINEFIELD OF TRADE-OFFS, HYPOCRISY, DOUble talk, and confusion with this month's coverage of sustainable development. When we sat down to plan the issue, we were tempted to emphasize only the positive, since so much is being done by builders now to conserve resources and build resource-efficient houses. It's all laudable.

But let's not fool ourselves: The industry's record on this issue is mixed. The history of the last 20 years is one of over-consumption of land, of overbuilding to meet the voracious appetites of new-home buyers and investors, and of general disregard for the sustainability of the products we put into new homes. Until recently, very few people in the mainstream of industry or politics seemed to care about sustainable development.

Economic growth was, and still is, the dominant issue facing the country. Our well-being depends on people buying more than they need—more house than they need, more car than they need, more food than they need, more holiday presents than they need. Sociologists would argue that you pay for over-consumption eventually, through diabetes, huge outlays for gas, personal bankruptcy, and foreclosure.

How do you get unsustainable development? When local governments decide that we can only develop 2-acre lots in far-flung suburbs and throw up roadblocks to higher-density infill development. When planning commissions decide in the name of fire safety to specify huge arterial roads in subdivision tracts that condemn people to drive everywhere.

It doesn't help matters when builders resist new development schemes that promote more walkable, higher-density communities. They argue that new urbanist developments require higher upfront pavement costs, call for unprofitable retail development, or demand mixed-housing types and income strata in a risky way.

THE ROAD NOT TAKEN

It's great that so many builders now sweat the details to produce homes that consume less energy. That's one of the most controllable ways that builders can minimize a new home's environmental impact. But when people buy a home that's bigger than they need and wind up consuming more energy anyway, what good does that do?

And let's be honest, the almighty dollar influences nearly every product decision made by a builder on a house. Unless customers insist on a green course, most builders view the environmental impact of a spec as a secondary decision. For years, builders have told us that buyers simply wouldn't pay the extra cost for resource-efficient products.



KATHERINE LAMBERT

We need better information. One of the problems in the marketplace today is that it's still difficult to determine what products are made from and where their components are sourced. It's hard to tell whether products are made with recycled or virgin material. It's hard to say whether manufacturers recycle material in their workplace or whether they know the forest stewardship practices of their suppliers.

WHAT'S NEXT?

Even if you built a home to the highest green standards out there, you would still have to buy carbon credits to offset the home's impact on the environment. Odds are, you would still be using energy from the grid somewhere, probably from a coal-fired power plant, unless you installed solar or other systems to generate power at home.

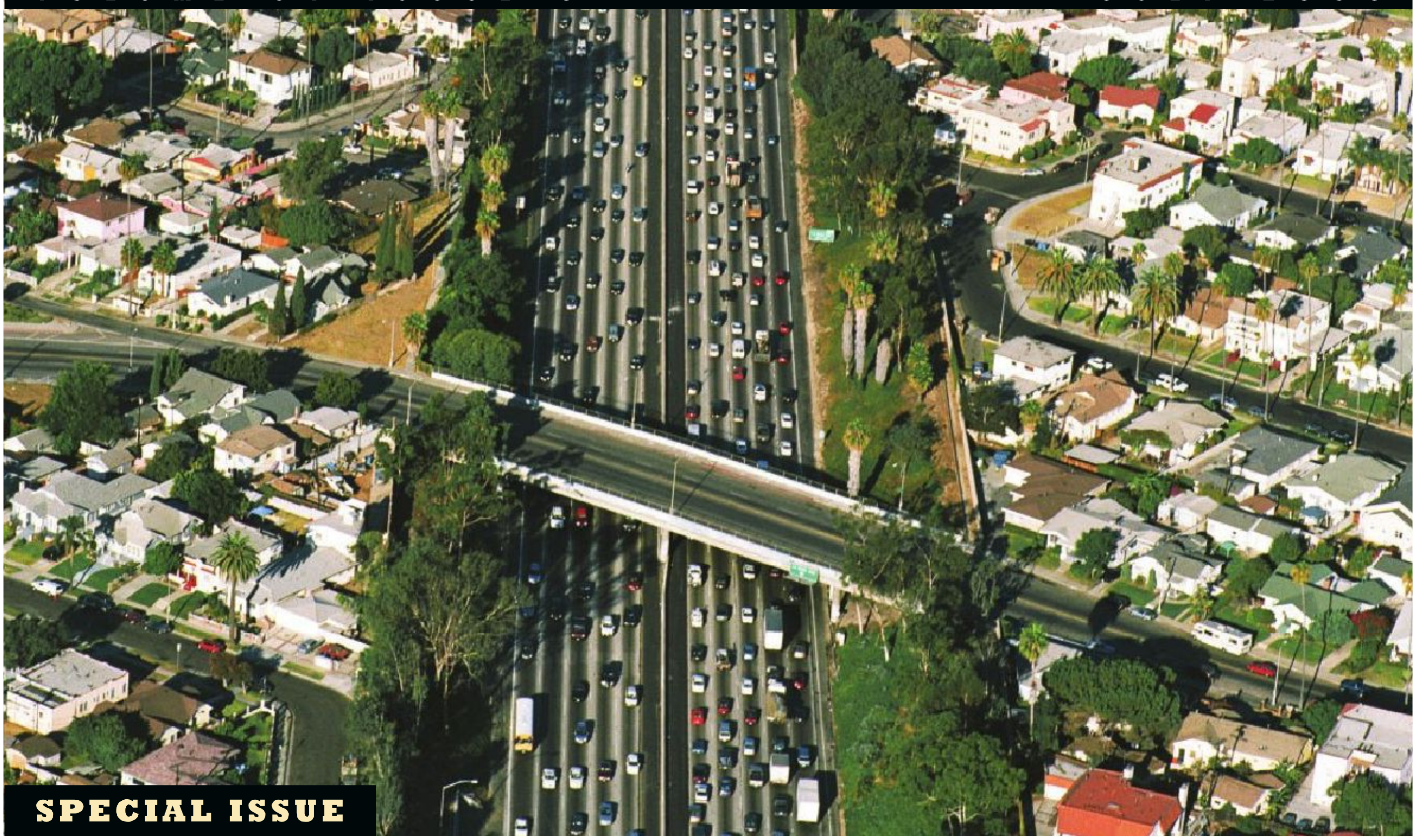
There are no easy answers or solutions. But the pressure for sustainable development is only going to grow, especially when you consider that the U.S. is one of the few countries in the world still adding people and new households. We need to build places for these people to live that minimize the impact on the ecosphere. It won't be easy, but it's a worthwhile goal.

Boyce Thompson

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Builder

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SPECIAL ISSUE

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JULY 2008



WILL DEVELOPMENT DESTROY THE PLANET?

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